

MANAGEMENT VIEW

"A NEW SENSE OF URGENCY" concerning the purposes of the nation and the means of achieving them is shared by investor-owned electric utility companies, declared EEI Pres. Sherman R. Knapp in opening the Institute's recent annual convention in NYC. (See special section in this issue for Convention Report.) He added: "In setting our sights on the targets for tomorrow . . . we do not doubt the ability of free men working in a free economy to achieve the goals required in electric power resources for the future."

"THE JOB OF TOMORROW'S MANAGERS will be vastly more difficult," says Cleveland Elect. Illuminating Co.'s Pres. Ralph M. Besse, an EEI convention speaker. Whether tomorrow's managers "become champions or deteriorate to bush-leaguers depends entirely on the programs and systems designed to aid them," said Mr. Besse, who called on top executives in the electric utility industry to "assume personal direction of specific programs to achieve the best in management."

ANOTHER "CREDITABLE" YEAR further demonstrated the electric utility industry's "extraordinary" ability to cope with the forces of economic recession, concludes Michael J. Kraemer in Commonwealth Services "Perspective." The consultant noted 1960 increases in operating income, net income and in cash dividends distributed (up about four percent). Another appraisal, by the Value Line Investment Survey, agrees, conceding that "continued progress in the electric utility industry seems assured"; but, then cautions investors that "even in terms of capital growth, electric utility stocks at current prices have lost much of their former allure."

STOCK SPLITS IN ILLINOIS--At Central Illinois Elect. & Gas a 2-for-1 split was proposed to stockholders, who would get a dividend of 22-cents a share compared with the present 36-cents a share rate. And, at Commonwealth Edison Co. Chairman Gale responded to a question in the utility's annual shareholders' meeting by

acknowledging that his company's stock was close to the level where a split would be logical, though no board action had been taken.

FAIR AND NON-COLLUSIVE--Prices paid by utility companies for equipment involved in the period of anti-trust actions must have been both, points out Con Edison's Chairman H. C. Forbes in his recent statement for shareholders. (Commonwealth Edison's Gale covered the matter of possible damage recovery in detail in his report to stockholders--See p. 29.)

TVA HEAD "DISTORTS" TAX STORY, representatives of investor-owned utilities in Kentucky have charged. TVA Chairman Vogel noted recently that TVA and its Kentucky distribution systems made payments in Kentucky of tax or tax equivalents equal to 6.4-percent of combined revenue from power customers--comparable to 5.2-percent for Louisville G. & E. Co. and 5.9-percent for Kentucky Utilities Co. Responding, KU's V-P A. Clay Stewart declared that the state's four investor-owned electric companies paid 14 times as much taxes in 1960 as the public power agencies operating in Kentucky. And, LG&E's Pres. Geo. Armstrong accused Gen. Vogel of omitting mention of federal income taxes altogether, noting that his company paid for such taxes \$20.18 out of every \$100 of electric revenue.

BEST DEFENSE--THE RECORD--That's what the area development manager of the Dept. of Water & Power, City of Los Angeles advises. He revealed in a recent APPA meeting that proof in his files saved his industrial development program twice in the past when management consulting firms suggested to his management that his function be abandoned "because there could be no more industrial development in the area." His record, documented: production of ten dollars in annual revenue for every dollar expended.

FIRM POWER PURCHASE of 300,000-kw by Commonwealth Edison from American Electric Power for five summer and fall months of 1964 will allow the former to defer for almost a year installation of

NEWS IN PERSPECTIVE

the first of two 560,000-kw turbo-generator units (from Westinghouse). A dividend from interconnection, the deferment takes advantage of AEP's winter peak to serve Commonwealth's summer peak.

ECONOMIC CLIMATE

AT MID-YEAR, the business outlook is for continued upward movement. The pace is not likely to be disturbingly rapid, and unemployment will remain a sizable problem. The recession clearly is over, and attention is turning toward the prospects for the U. S. economy in 1962.

GOOD BUSINESS in the coming year is anticipated--perhaps spurred by a tax cut. The Administration is thinking seriously of this, but it must first decide whether the added stimulus this would give to the economy is worth the increased federal deficit that it would cost. In fiscal 1962, chances are good that the federal red ink figure will exceed \$5 billion, despite far smaller official estimates. In addition, local government spending probably will rise more than \$2 billion. But deficit spending, plus increased private investment, probably will do little more than offset growth in the labor force and in productivity. In dollar terms, 1962 could show a gain of at least 5 percent over 1961—but some of this would be attributable to higher prices.

THE PRICE TREND is about to resume rising after six months of stability. The rise will be slow; it will not exceed an annual rate of three percent. A modest temporary dip in food prices is expected over the summer. Costs of services will continue to go up; they will probably be the fastest-moving segment of the consumer price index. Increases in wages and other costs will touch off a slight hike in manufactured goods prices, except that automobiles will sell for less until the 1962 models appear.

WASHINGTON INFLUENCE

COMPETITIVE A-POWER came one step nearer when AEC revised its charges

for enriched and depleted uranium. Base charges are lowered and the use-charge increased from 4 percent to 4.75 percent. Net effect is to lower the cost of nuclear power although the reduction varies from one reactor to another. Chairman Seaborg says the changes bring into better balance AEC's charges for enriched uranium compared with the current market price for natural uranium. Net savings in A-power production may range from between 3 and 6 mills per kwh. Prices for plutonium and U-233 through fiscal 1963 are not affected, but Seaborg suggests that as nuclear power becomes more nearly economically competitive, "it will be desirable to move toward prices determined by normal market factors of supply and demand."

PRIVATE OWNERSHIP of special nuclear material is under consideration by AEC. It would plan to keep effective international safeguards as well as government control (specified by law) of the domestic market. AEC is also concerned with handling the transition between government and private ownership. For example, if government ownership of plutonium and U-233 produced in privately owned facilities were to be ended, AEC Chief Seaborg says AEC "might well find it advisable to announce its willingness to buy these materials . . . at their fuel value for a few years beyond June 30, 1963, until a free market could be established." If these estimated fuel values were related to the change for enriched uranium, they would be reduced by about 20 percent.

OPPOSE BURNS CREEK--Before a House Reclamation subcommittee hearing, representatives of Idaho and Utah power companies called the project "unnecessary." Idaho Pwr. Co.'s R. A. Hogg called it a "power project in the guise of reclamation . . ."

HANFORD CONVERSION--strongly backed on all fronts by the Administration—is just as strongly opposed by private industry. Sherman R. Knapp, EEI president, maintains that NPR would "establish a dangerous and unnecessary precedent" since it is "not the proper function of the federal government to

build and operate thermal plants for the production of power for sale to the public." He argues against its economic soundness since the power needs "can be financed in the free market." No technological contribution would be forthcoming since the major portion of R&D "is oriented toward the development of materials and systems for high-temperature nuclear power plants." Economically competitive A-power will not be achieved, Knapp asserts, "if we must rely on the steam conditions of the NPR." A more profitable use for the \$95 million, he suggests, would be for "more basic projects such as nuclear fuel research." The U. S. Chamber of Commerce, in opposing Hanford, says it would be better for the country if AEC continues to work with the 132 companies already in A-power rather than to start to compete with them. (See "Washington Outlook," p. 31.)

AEC SAFETY CLEARANCE has been given to the Piqua (Ohio) A-power facility. The reactor safeguard committee suggests that at each partial fuel reloading cycle (approximately every four to six months) an inspection be made of a typical sample portion of the remaining fuel elements and a report made to AEC. The Commission will own the 11,400 kw reactor but the city will operate the plant and purchase the reactor's steam from AEC. Construction is expected to be completed by Fall 1961.

RECLAMATION'S PLANS for the Missouri Basin, detailed by Assistant Secretary Holum, emphasize intense, coordinated studies to solve the problems of inadequacy of the Bureau's hydrosystem to meet customer requirements after 1965. It plans to firm its own energy by purchasing thermal power. After 1965, the amount and the kinds of energy "will depend upon the plans worked out in cooperation with the representatives of the consumer-owned utilities and the Federal agencies." Preliminary studies show that "reserve arrangements can be made to support comparatively large thermal units." Also under consideration are networks "to determine the differences in the Bureau's future transmission system, which may occur as a result of various locations of future steam generating plants." These studies will be

coordinated with the needs and transmission building plans of preference customers. The Bureau is looking into integration of hydro and thermal power and interconnecting Missouri Basin's Eastern and Western divisions.

CHANGE IN NEZ PERCE application has been denied by FPC. The Commission sustained an examiner's ruling which denied Washington Public Power Supply System's request to amend its proposal to show willingness to build the alternative High Mountain Sheep dam. WPPSS's next move was to file with the FPC new designs "which will lower total construction cost \$51.5-million from the earlier figure of \$348.5-million." Design proposes an underground powerhouse.

PACIFIC COAST INTERTIE, under study by a Dept. of Interior task force, has a November deadline for a final report. A preliminary report by BPA's Chas. Luce indicates "general agreement" on idea that the northern area should export to the southern area "only that amount of electric energy that is surplus to the needs of the Northwest." Estimate of surplus is 2- to 25-billion kwh, and the study finds that California can absorb a "part of any surplus peaking capacity."

"NO NEW STARTS" policy on natural resource projects has been rejected, President Kennedy repeated in a message to the National Rivers and Harbors Congress. Budget Director David E. Bell, predicting that the federal budget would be in balance in fiscal 1963 and thereafter, supported giving high priority to natural resource development and conservation. Sen. Allen Ellender (D., La.) explained his continuing support of resource projects as "an investment in America's future" not "an extravagance." Interior Secretary Stewart Udall asserted that the Administration is "resource development conscious."

PACKAGED A-POWER PLANT has been airlifted to South Dakota from Baltimore. It will be trucked to Wyoming for assembly. The "Sundance" reactor, when operating, will give 1,000 electrical kw and 7 million BTU of heat an hour for an Air Force radar site. The reactor itself is cooled and moderated by "light" water, fueled by highly enriched uranium.

INDUSTRY SIFTINGS

PENNSYLVANIA UTILITIES ON TOP--EEI

annual convention honors went to two Keystone state companies: Penn. Elect. Co. receiving the Edison Award, Philadelphia Elect. Co. the Reddy Kilowatt.

INDUSTRY COURSE IN FUNDAMENTALS, one

of a series of employee information programs offered by EEI, follows up on two earlier presentations on the "American Economic System" and "American Freedom." More than 60,000 power company employees participated in the earlier programs. The new course is one-hour-a-month for six months.

"GOOD JOB," SAY 9 OUT OF 10—That's

the public's view of Commonwealth Edison, measured in a survey last year and revealed to stockholders by CE's V-P Morgan F. Murphy. What the utility's customers like: emergency service, a light bulb exchange program, savings afforded by prompt bill payment. A big 85-percent think CE does a good job of "keeping charges in line." Only three-percent wanted to go back to monthly billing, only two-percent wanted to return to envelope billing.

EEI's COMMERCIAL COOKING GROUP dis-

played an impressive series of direct mail promotion pieces at its recent annual meeting. Prices range from \$2 to \$4 a hundred for postcards and leaflets to \$12.50 a hundred for a broadside on counter ovens and \$22.50 a hundred for a "Guide for Planning and Operating Church Kitchens." (Non-members of EEI can order this material for a 10-percent extra charge.)

NEW KITCHEN DISPLAY CENTER opened

last month in the Commonwealth Edison Bldg. in Chicago by Hotpoint is Chicago's first and the world's largest, according to the GE division. The new 5300-sq ft center cost \$100,000, is tagged "Operation Showroom." Sales Mgr. John F. McDaniel expects the planning center to draw 200 or more people a day. No prices are quoted or sales made, but "that's 200 more people who will see our products and get free demonstrations," he says.

MEDALLION HOME STANDARDS are now

applicable to multi-family dwellings for the first time. NEMA has also simpli-

fied the list of optional major appliances which is revised in the recently published standards.

PLUG-IN GAS APPLIANCES may become a reality before long, if a field test program of the AGA is successful, according to a report made recently to an Association conference by an AGA Lab official.

STUDENTS HOLD STOCK IN TECO—Prom-

inent in this year's annual stockholders meeting of the Tampa Elect. Co. were three representatives of 70 students in a high school history class which recently bought one share of TECO stock . . . in an effort to learn the importance of capitalism in the U. S. What they learned: in a short period of ownership, their share purchased at \$34 grew in value to \$41, also drew a quarterly dividend of 18-cents.

USSR'S ELECTRIFICATION PLAN is

called "first and foremost" in Russia's long-range economic development plan—reported by the USSR Embassy to be in preparation. The USSR Minister of Electric Power Station Construction says: "We believe that in order to ensure the priority development of power engineering compared with industrial production as a whole, it is necessary to increase the capacity of power stations by about seven or eight times . . . to cover almost the entire inhabited territory of the country. We are confident these tasks will be fulfilled."

MONTHLY HEAT RATE: 9,915-Btu net

kwh—This milestone, marking its first monthly rate under 10,000, was achieved in April by P. S. Elect. & Gas Co. (N. J.). Reason: increased sales, plus installation of larger and better generating units, says the utility. Its long-term record: improvement from 17,000-Btu 30-years ago—an increase of 12-percent in thermal efficiency.

ELECTRICAL ENGINEERING SHOW, the

first industry-wide national exposition, is set for the N. Y. Coliseum next Jan. 29-Feb. 2. Sponsoring AIEE announced that "this horizontal, across-the-board Exposition will display the products and services of every branch of the industry . . . and will be "unique in its cross-breeding of ideas."



Commonwealth Edison's Gale: "Vigorous" on Anti-Trust— But, We Have a Job To Do

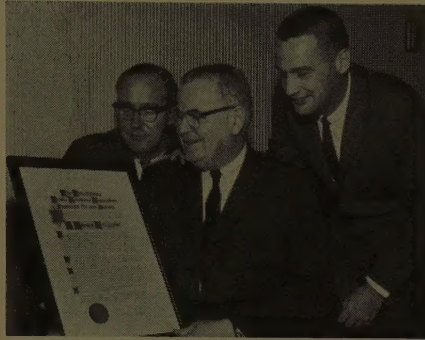
Many a stockholder with investments in electric utilities has looked for the prospect of a windfall from the anti-trust damage actions; but, many another has expressed sympathy for the electrical manufacturing companies involved. (As utility people know, the "prospect" of any return to the shareholder, or the utility customer, is slim—see p. 3).

Of the numerous references to the utility position on possible recovery of overcharges, particularly at annual stockholder meetings, that of Commonwealth Edison's Chairman Willis Gale is probably most "vigorous." Says Mr. Gale: "We are sympathetic, too, but we have a job to do and we are going to do it. It must be remembered that we were the victims, not the instigators of the conspiracy . . . and no one in our organization had any idea whatsoever that prices we were paying on the equipment involved in the anti-trust cases were collusive."

Mr. Gale went into some detail to explain his company's approach taken because we have "absolutely no choice." He observed:

"If we were to say, let's be good sports and forget all about it, every one of our directors and officers would be liable to both stockholders and customers. You must not forget that these manufacturers have pleaded guilty to charges of illegal conspiracies to fix prices and divide markets. Quite apart from this legal aspect, it is a basic management responsibility for us to seek redress for any overcharges. Experts have been employed by a group of 126 investor-owned utilities to investigate certain phases of the matter. This suggests that we are not alone in our determination to take vigorous action.

"The predominant note of a great many of our letters from stock-



Winner of the Philadelphia Public Relations Assoc. 1961 award, R. G. Rinciffe, president of the Philadelphia Elect. Co. is shown with Association officers F. C. P. McGlinn and J. M. Kiss. Mr. Rinciffe was saluted for his efforts in promoting the Port of Philadelphia and in "uniting utility companies through the country for development of peaceful uses of atomic power."

holders—and one which disturbs me very much—is the indication that many people appear to condone price-fixing and agreements to divide markets. I'm not going to give a lecture on our free enterprise system, but I do suggest that everyone of us should give serious consideration to what kind of an economic society we would have if competition were to be replaced by informal cartels. Competition may be rough but it is much better than prices fixed by government which would inevitably become the alternative.

"Several manufacturers discussed this matter in their 1960 annual reports," Mr. Gale noted. He quoted from three of them:

"General Electric said it 'believes that the anti-trust laws should be aggressively enforced.'"

"Westinghouse stated that 'the acts charged in the suits were unauthorized and strictly contrary to Westinghouse policy, which requires that anti-trust laws must be obeyed.'"

"Allis-Chalmers asserted that 'it firmly believes in the enforcement of the anti-trust laws.'"

Mr. Gale continued:

"It is no answer to suggest that business should not be subject to anti-trust laws because some labor

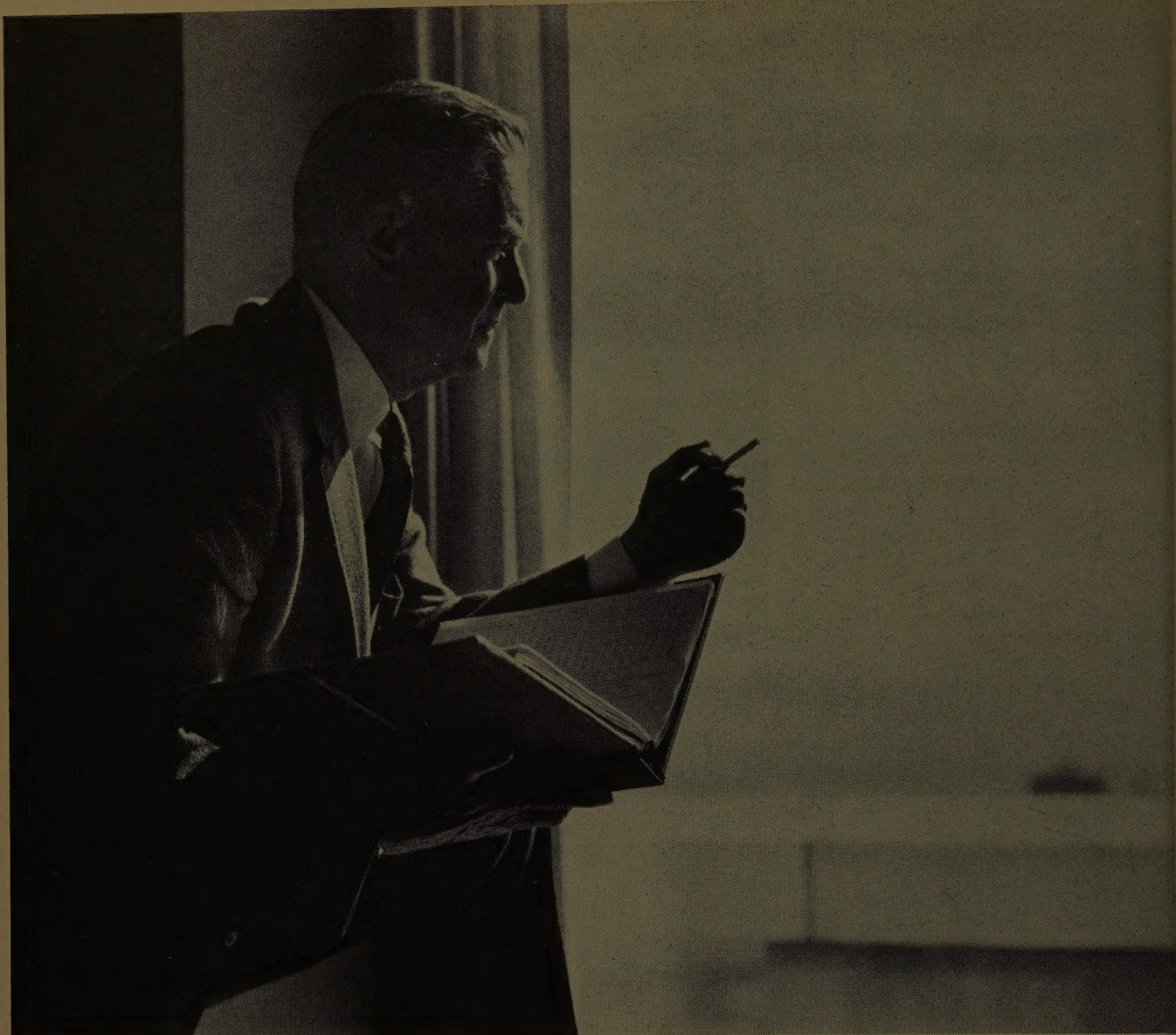
activities may be exempt. There is no question in my mind but that the anti-trust laws are a necessary part of our business structure and should be vigorously, but fairly, enforced. The extent to which labor should be subject to such laws is a different and unrelated matter.

"A number of stockholders have expressed concern that we might spend large amounts for legal fees and other expenses in connection with the anti-trust matter. Considering its importance, our costs will be modest. In addition to our own investigations by Company personnel, we have joined other investor-owned utilities in a common investigation of certain phases of the matter. Our share of the cost of this is expected to be on the order of \$30,000. We are now using our regular counsel exclusively and their fees and expenses for this work will be on a bare-bones interim basis, pending the outcome of any litigation or settlement. If we are successful in obtaining redress, our recoveries are likely to be many times our costs. If we are not successful, we

(Continued on page 33)



"The Lamplighters of America," a new national organization to promote safer nighttime travel, was launched recently in San Francisco, with PG&E's Pres. Norman R. Sutherland (a one-time lamplighter himself) symbolically lighting the organization's standard—a model of an early street lamp. At left is J. H. Burson, a Westinghouse street lighting engineer and chairman of the founding body, and G. A. Trosper, a charter officer.



How long will utilities be able to buy the right kind of coal?

In the look-ahead world of electric utilities, 1981 can be here tomorrow morning.

The projected growth rate of electric needs makes it clear that the man who buys coal for a utility must pick his suppliers not only for what they can deliver now but for the next 20 or 30 years. He must be able to count on adequate reserves—of not just *coal*, but the right *kind* of coal. Coal that's free of hidden incremental costs that raise the invoice price with excessive coal handling, ash handling, equipment outages and freight charges on inerts. Coal that can deliver steam at the lowest possible cost.

To this utility man who lives partly in 1981, Island Creek offers a mighty reassuring picture of long-term quality and uniformity of supply. We'd welcome a discussion of your own searching look into that *very* near future. Write, wire or phone.



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Public Power Pig-In-A-Poke

The Administration's proposal to spend \$95-million to convert the AEC's New Production Reactor at Hanford, Washington to the generation of some 700,000-kilowatts of power has built up a controversy as perplexing as it is heated. As the issue moved last month toward a showdown in Congress, it had become apparent that whatever decision is reached will be bottomed primarily on political considerations.

So many aspects of NPR conversion are cloaked in strict military secrecy the project is incapable of being presented to Congress and the taxpayers on the basis of any clear-cut economic analysis. Contentions of proponents and opponents alike have been countered over and over again with "yes, but" arguments which usually have found their way back eventually to the classified dead-end.

One of the few known economic facts is that the reactor, as is, cost \$145 million, of which \$25-million went for facilities that would permit later conversion to power production. But the determination of conversion feasibility, according to AEC, was based on an allocation to power of just the proposed additional \$95-million for generating facilities. At the recent NPR conversion hearing before the Joint Committee on Atomic Energy, AEC Chairman Glenn Seaborg stated that whether any of the \$25-million spent to enable dual purpose operation is allocable to power "is a matter that has not yet been determined," and will require further study by AEC and the Interior Department. There is no intention to charge power with any of the cost of the reactor itself.

As to just what is the cost of the power, based on the bare \$95-million investment—well, that gets into the classified area.

Although some haziness still lingers, it has been fairly well established that conversion of NPR would make no significant contribution to advancement of civilian power reactor technology, and that the money involved could be spent

more advantageously on a variety of other projects. This was confirmed by a substantial majority of 25 outstanding nuclear experts who were queried independently by Rep. Craig Hosmer (R-Cal.), a member of JCAE.

CONG. HOSMER'S survey of 25 outstanding nuclear experts in industry and at universities shows that about two-thirds of the respondents see no substantial contribution to civilian technology . . . while about 85-percent feel that power technology could be better advanced by spending \$95-million or lesser amounts on a variety of other projects.

Dr. Seaborg claimed at the NPR hearing that conversion would be valuable from the standpoint of gaining experience in operating a large nuclear power plant in conjunction with the demands of a large power system; also in the manufacture and operation of large turbines employing low-pressure, saturated steam.

Sherman Knapp, president of the Edison Electric Institute, put it this way in a letter to JCAE: "The reactor obviously produces heat that can be utilized. But the advancement of nuclear technology and the utilization of the most economical means of producing power in the Northwest should be uppermost in our minds and not the utilization of steam which can be considered primitive in our modern utility technology. The uneconomical use of the low-temperature, low-pressure steam of the NPR will not add to our prestige in the international scientific community, nor will it advance nuclear technology.

Mr. Knapp said the conversion money could be spent more profitably, from a nuclear power progress standpoint, on more basic projects.

Just how much the Northwest needs, and could rely on, Hanford power is another question still looking for a straight answer. In seek-

ing a moratorium on hydro development on the Middle Snake River, Interior Secretary Udall emphasized the importance of the substantial amount of power anticipated from Canadian storage as a means of meeting the Northwest's future power needs. In support of NPR conversion, Sec'y. Udall said that Hanford power is needed, along with power from Canadian storage, to permit Bonneville Power Administration to serve new loads on its system after 1964 and to help prevent a power "brownout" in the Northwest. His statement also included a plug for the proposed Bonneville-California intertie (an important link in the envisioned giant grid) by noting that NPR conversion would be "greatly enhanced" by the intertie. He said later that the availability of Hanford power would make the intertie "almost essential."

But when BPA Administrator Charles Luce was questioned at the JCAE hearing concerning the substantial power surplus estimated by the so-called Zinder report for Bonneville by 1965-66, he said that estimate concerned only the proposed intertie. The intertie, he claimed, is related to the problem of moving dump power, and "is not connected with the Hanford project one way or the other."

Other factors, either unknown or the subject of conflicting claims, involved in the NPR deal include such significantly pertinent matters as fuel costs and the capacity at which the converted facility could be operated.

However, the proponents of deeper federal penetration into the electric power business—those who are pushing hardest for NPR conversion—are not in the least fazed by unknowns that cloud economic feasibility, or by a lack of contribution to technological advancement. Their goal is a thermal plant precedent in the Northwest, cost what it may to the taxpayers.

The NPR project should be seen for what it is: a public power pig-in-a-poke.



ON EAST AND WEST COASTS the outlook for competitive nuclear power was encouraging this Spring. About *Yankee, New England Elect. System's* Pres. Wm. Weber observed: "Final cost should be less than the estimate by some 8-10 million dollars, and there is a good possibility that eventual power costs will be more nearly competitive with conventional power in New England than was anticipated." (Operators of *Yankee* now expect 11-13 mill power with the first or second core.) About *Indian Point, Con-Edison's* V-P James Fairman states: "I am convinced it is a long step in the direction of nuclear power." (Indian Point is expected to achieve criticality late this Fall, delayed from early estimates, but not largely by "labor troubles," as EL&P inadvertently noted on p. 51, May 15 issue.)

OUT IN CALIFORNIA "atomic power is a must in the foreseeable future," PG&E's C. C. Welchel told a PCEA symposium on "The Future of Atomic Power" recently. He predicted that, "except for special situations, PG&E's last conventional steam-operated generating unit will be installed in the late '60's." And, *So. Cal. Edison's* Chairman Quinton observed: "It seems clear now that capital costs are possible now which may be no more than one-fifth of those obtained from the Shippingport plant."

WASTE DISPOSAL COSTS figured on the basis of "perpetual care" in tanks of present design, as well as with ultimate disposal methods under study—fall within the range of one- to two-percent of the cost of nuclear power in an 8- to 10-mill/kwh economy. This was reported to an Industrial Waste Conference at the U. of Purdue recently by the AEC's Walter G. Belter.

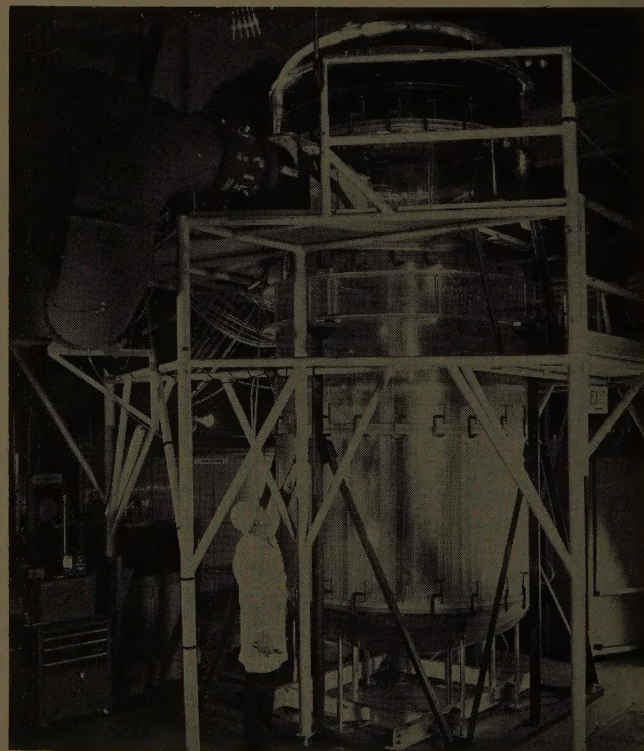
SAFETY REVIEW OF REACTORS constructed for AEC ownership (and not subject to licensing) is now open to public participation, just as in the case of reactors which are privately owned and subject to licensing under the Commission's Power Reactor Demonstration Program. This procedure is now authorized under an AEC regulation (10 CFR Part 115) which became effective last month.

IF FINANCIAL INCENTIVES FAIL to give us the program we need, AEC Chairman commented in his testimony for the JCC, nuclear plants might be constructed by the AEC on publicly or privately owned power grids, with utilities asked to operate them. A utility would buy electric power from such a plant for a fixed period of time (at some predetermined rate developed under competitive proposals from utilities), Dr. Seaborg explained. "At the end of the fixed period, the utility would be committed by contract to purchase and the government to sell, the plant at a price which would allow it to compete with conventional plants of the same size."

OUT WEST IN CANADA, though, if nuclear power forges ahead rapidly, they have something to lose. That's what John Davis, director of research and planning for *British Columbia Elect. Co., Ltd.*, told the first annual meeting of the Canadian Nuclear Assoc. "Gone would be our major advantage over the energy deficient areas of the world," he said. The offset idea he suggested: "Why not spend more of the nation's R & D dollars out West? Why not look around for a few energy intensive activities which could help us pay for all those nuclear reactors which you would like to sell us some day?"

SPENT FUEL ELEMENT SHIPPING procedures and cask design criteria must be acceptable from radiological and criticality considerations—objectives of the AEC, which recognizes the fact that a number of reactors soon will be ready for refueling and shipments of irradiated fuel elements will be increasing. An industry advisory conference held in Washington recently provided the AEC with both industry and government views on this problem.

STEAM-COOLED REACTORS, studied for an AEC appraisal, have a potential for producing power at costs of 7.0-mills per kwh, plus or minus .4-mill, in a 300-mw size plant. Seven of the concepts (of ten studied) show no significant differences in economic potential.



Half-size model of High Temperature Gas-Cooled Reactor simulates gas flow conditions of the full-size prototype nuclear plant to be built by Philadelphia Elect. Co. and 52 other U. S. utilities at Peach Bottom, Pa. It is in use at General Dynamics' San Diego, Cal. development facilities.



Manufacturing Industries in An Inflationary Economy

A review of the chart for all manufacturing corporations in the United States shows that since the end of World War II, the gap between the money invested in plant and equipment plus inventories and capital plus retained earnings gradually has been closing.

This "gap" represents the "free assets" of a corporation—investment in plant and equipment being in the nature of frozen assets, and investment in inventories being in the nature of assets temporarily frozen—that is, not immediately available to meet current expenses and obligations.

As the "free assets" have contracted it has been necessary for the corporations (as a whole) to assume long-term debt for the purpose for which "free assets" generally are required. This conclusion is inescapable.

In general, the "free assets" should equal 20-percent of the amount of the capital plus retained earnings if the assumption of long-term debt is to be avoided. This situation prevailed prior to 1945 and the long-term debt relatively was small.

Since 1945 it will be noted that in consequence of the steady contraction of the "free assets," there has been a steady increase in the amount of long-term debt, which has increased from \$7-billion at the end of 1945 to \$30-billion at the end of 1960. The tabulation shows comparative figures, 1957-1960.

Today the most pressing need of manufacturing corporations is an increase in the depreciation allowance, before taxes, on plant and equipment.

Increased depreciation allowances are needed to permit the purchase of more up-to-date cost reduction machinery and equipment. Today this need is imperative—

first—to meet the rising costs which threaten the continued successful operation of many corporations in the American economy.

second—to meet foreign competition, which is becoming increasingly more serious. In this connection, the following statement appearing in "Human Events," April 7, 1961, shows how much more liberal are the depreciation allowances in foreign countries:

"Barron's financial weekly observed, March 27,

that on equipment with a 15-year life, 'US businessmen can write off 13-percent of the cost in the first service year as a deduction from taxable income, British and Japanese over 50-percent, Swedish and Italian over 30-percent, and Canadian and French over 20-percent. For the first three years, Americans can write off 35-percent, Britons and Swedes over 70-percent, Japanese and Italians over 60-percent, Canadians 54-percent, and Frenchmen 47-percent.'

Currently the plans of the Washington Administration in regard to an increase in the depreciation allowances do not appear adequate to meet the needs of manufacturing industry in the United States, but it is to be hoped that further consideration of the situation by Congress will lead to the adoption of more liberal proposals.

Financial Report for Manufacturing Corporations— 1957, 1958, 1959, and 1960

| | 1957 | Dollars in Billions | | | 1960 |
|------------------------------|-------|---------------------|-------|--|-------|
| | | 1958 | 1959 | | |
| Billings | 320.0 | 304.6 | 337.8 | | 345.6 |
| Net Profit (before Taxes) | 28.2 | 22.6 | 29.7 | | 27.5 |
| Net Profit (after Taxes) | 15.4 | 12.7 | 16.3 | | 15.2 |
| Cash Dividends | 7.56 | 7.37 | 7.91 | | 8.5 |
| Plant and Equipment | 86.9 | 90.1 | 94.5 | | 100.5 |
| Inventories | 56.3 | 53.0 | 57.9 | | 60.4 |
| Total (A) | 143.2 | 143.1 | 152.4 | | 160.9 |
| Capital Stock | 59.6 | 61.7 | 65.3 | | 68.5 |
| Surplus | 82.0 | 85.7 | 92.2 | | 97.1 |
| Total (B) | 141.6 | 147.4 | 157.5 | | 165.6 |
| Free Assets (C) (B — A) | —1.6 | +4.3 | +5.1 | | +4.7 |
| Long-Term Debt (D) | 26.3 | 28.5 | 29.5 | | 31.3 |
| Total Free Assets (C + D) | 24.7 | 32.8 | 34.6 | | 36.0 |

Data abstracted from reports by Federal Trade Commission,
Securities and Exchange Commission

Anti-Trust—From p. 29

will have spent a modest amount to carry out our responsibility.

"I regret to point out that our stockholders should not gain the impression that these anti-trust actions are going to be of important direct benefit to them. Any overcharges we have paid are largely in our property account, and a major part

of any recovery will be applied against the equipment we purchased. This would tend to benefit our customers more directly than our stockholders.

"But stockholders should not assume that this course is not in their interest. Anything which enables us to do a better job for our customers, will, in the long run, make it easier for us to do a better job for our

stockholders.

"Actually, we ourselves are not going to be vindictive toward companies which have done a wonderful research and development job for our industry. Looking to the future, it would be unfortunate if this research were to be cut off. I can't believe that the basic financial integrity of the various companies will be seriously impaired."



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Electric Light and Power, July 1, 1961

EDISON ELECTRIC INSTITUTE

29th ANNUAL CONVENTION



"TARGETS FOR TOMORROW" are not expected to be attained in the electric power industry without extraordinary effort in a wide range of directions, from research, to finance, sales, and management leadership. Speakers at the Edison Electric Institute's 29th annual convention in New York City urged renewed vigor in meeting these challenges among many confronting the industry in this 80th year after its beginning from the creation of Thomas A. Edison.

More than 1700 men were registered in total attendance that exceeded 3000—largest male registration ever recorded in a convention held in a location other than Atlantic City, where the convention will return in 1962. (Denver has been confirmed as the location for the '63 convention.)

Chief interest in actions at the convention concentrated on identity of the Edison Award winner and on the selection of new Institute officers. For the Pennsylvania Electric Co., Pres. Louis H. Roddis, Jr., accepted the industry's highest honor . . . "for developing the engineering concept and pioneering in the design and actual construction of America's first 460-kv transmission line operating as a major component of an integrated power network." (See EL&P, Dec. 15, p. 56—"America's First Kilowatt Turnpike Operating at 460-Kv".)

In acknowledging his election as EEI president, Philip A. Fleger, chairman and president of the Duquesne Light Co., warned the investor-owned electric companies of "a new and greatly intensified campaign being launched by the advocates of government power." Mr. Fleger urged the industry to emphasize its strong points: Its record of service, economy, vision and citizenship.

The new EEI head added: "But, we cannot stand on these strong points alone. We must show the American people the weak points of government power . . . just how unnecessary and wasteful these Federal power projects are. I am confident that we can overcome this new and greatly intensified campaign . . . if we are united for the common good."

W. W. Lynch, president of Texas Power & Light Co., was elected vice-president of the Institute.

Among 22 companies recognized for outstanding annual reports for the year 1960, top winner was the Philadelphia Elect. Co., for "general overall excellence." Other first awards in specific classes (depending on size and type of company) in the competition for the 22nd Reddy Kilowatt Annual Report Awards went to: Consumers Power Co.; Arkansas P. & L. Co.; the Hawaii Elect. Co., Ltd.; So. Nevada Power Co.; Amer. Elect. Power Co., Inc.; and the Shawinigan Water & Power Co.

Aiming For The Future

By SHERMAN R. KNAPP, President
Edison Electric Institute
and
President, The Connecticut Light &
Power Company



Despite regulation and competition, industry's growth is phenomenal; it will continue if we take advantage of new technological developments, pool resources, train talented manpower, and educate the public.

IT WAS recognized early in the industry's history that it would be uneconomical for a given area to be served by more than one supplier because of the high ratio of capital investment to revenue. In this country, regulation of utility enterprises by governmental authority became the most widely used means of seeing that the public interest was protected against the basically monopolistic character of the public utility industry. There is ample evidence that the combination of regulation and competition has done an eminently satisfactory job in protecting the public. It is also clear that, for the most part, the public is pretty well satisfied with the way the investor-owned public utility industry functions within the framework of existing state and Federal regulation.

The most impressive evidence that our present system of regulation has done a good job stems from the fact that the average price of a residential kilowatt-hour has dropped from about 6¢ at the time of Edison's death in 1931, to less than 2½¢ per kilowatt-hour today. During the same period, the cost of living has gone up 96 percent.

EEl President Knapp poses with management representatives of the utility company which received The Edison Award at this year's Institute convention—the Pennsylvania Electric Co.: A. F. Tegan, president of General Public Utilities Corp. (center) and Louis H. Roddis, Jr., president of Penelec, right.



In spite of the handicap of having to compete with subsidized government power, the investor-owned utility industry has had a remarkable record of growth. Through good times and bad, new uses for electricity in the home, in our commercial establishments and in industry have resulted in new sales records year after year. It is now one of America's largest industries with assets of over \$50 billion and an annual rate of expenditure for new equipment and facilities for supplying service amounting to about \$3½ billion. This represents about 10 percent of all business capital expenditures.

Load forecasts indicate that it is reasonable to expect our loads to continue to grow throughout the 1960's at the historic rate, which means doubling every ten years. If these forecasts are to be realized, we have much work to do in a number of different categories. We not only need to aim for the future—we must arm for it.

Growth in our loads has served to spur important technological advances which have resulted in greater efficiency of generation due to the use of higher temperatures and pressures in conventional thermal plants. Availability of larger units has also helped to hold down both initial capital costs and operating costs. In order to take advantage of these technological developments we have to find ways of enlarging our integrated operating areas. The most practical answer seems to be work with our neighbors to set up a logical, interconnected, integrated operating area of sufficient size to permit realizing optimum results. This means that, at least with respect to generation and transmission, the system should be planned, built and operated without regard to corporate boundaries and in many instances without regard to political and geographic boundaries as well.

While I am convinced that power pooling is the soundest answer to our growth problems and that we must continue to enlarge our pooling areas in the years ahead, I don't want to give the impression that power pooling is easy. Getting along with your neighbors all the time is never an easy undertaking. For a lot of us who are used to giving orders and having them carried out, effective power pooling has meant a change in our own personal philosophy.

Another category which is going to need a great deal of attention during the Sixties is financing the continuing expansion of our industry. In the first place, we need to make sure that our present shareholders maintain their confidence in future prosperity of our industry. We also need to be ever on the alert to attract new investors. Many of our more progressive companies have developed impressive programs designed to keep shareholders better informed so as to maintain their continued interest.

With the expansion of the power-pooling concept there are going to be many new problems to be faced in the financing of various sizes and shapes of joint undertakings. We have had some experience in that direction in New England in the setting up and implementing of the Yankee Atomic Electric Company, which is owned by ten of our New England com-

panies in varying percentages, ranging from a maximum of 30 percent down to a little less than five percent each. I suspect that there will be problems which will involve the state legislatures, regulatory bodies, investment bankers, as well as our own staffs, in new and unique situations which can only be resolved by the exercise of patience, intelligence and ingenuity. This phase of our future operations poses perhaps a greater challenge than the technical and engineering problems.

We will find no lack of things to keep us busy in the future. There is no sign that the cold war on the government-power front is going to let up. The job of educating our customers, and the public in general, on what makes our industry tick—in fact, how our whole economic system functions—is a continuing one. The existence of the Live Better Electrically Program is recognition that we must continue an aggressive selling policy if we hope to obtain our growth objectives.

The Political and Economic Climate Ahead

By Dr. EMERSON P. SCHMIDT, Director of Economic Research Department, Chamber of Commerce of the United States



Soul searching is a necessity before trying to solve the problems of government.

ALTHOUGH our exports or imports amount to less than five percent of our Gross National Product and we are one of the more self-sufficient nations, we have been maneuvered into a position under which foreign affairs and our international entanglements now dominate—and will continue to dominate—our domestic, political and economic climate. Our international position is weaker and far more dangerous than is commonly assumed.

Besides economic goals we also have other, non-economic goals, such as national security; government may be useful in attaining that goal and others. But government is potentially dangerous because it has the power to tax (wring from the citizen involuntary contributions) and it has a monopoly of the use of force (it *should* have such a monopoly).

Concentration of power is the great threat to freedom. Where human freedom has failed, government has become the tyrant. The great enemy of mankind is overly concentrated government, a lesson which is being lost here and never learned in many, if not most, parts of the world.

The major functions of government should be the protection of individual freedom both from foreign and domestic enemies, to preserve law and order, to protect property and help to foster competition and economic stability through a sound credit and money

The establishment of the new EEI Research Division and the fine support it has received from the member companies of EEI indicate that we are not going to be complacent as an industry, but instead will be alert to the possibilities of the new developments which are in the offing—particularly in the area of new means of direct conversion of heat energy to electricity.

With all this work to be done, let's not forget the job which is continually with us of developing manpower capable of carrying on in the years ahead. I am sure you realize that most of the work of the future will have to be carried out not by us but by others in our organizations who need our help now in order to reach their full potential later on. To meet the challenge of the future, our companies will need the best talent we can find. Talent, focused by competition and acting under regulation, can find the way to reach the targets of tomorrow and set new ones of its own.

policy. If government did these few things and did them well, we would be far better off than we are by having government intervene on countless fronts as it now does.

Beyond these basic functions, government may at times enable us to accomplish jointly things *which need doing* but which we cannot do through the free market or voluntary private effort. But any such enlargement of government functions is potentially fraught with danger.

Many companies today find the government to be such an important customer that their officers are subdued into speech-paralysis on key issues affecting the future of our country. Government doesn't have to act or even threaten; its power to damage the enterprise is so great that the mere existence of the power is enough! You just don't offend a good customer.

Many of the activities of government compete unfairly with the private effort of the citizen trying to make a living and make the private market work less well, rather than better. Much of this intervention and competition is tainted with immoral and unethical practices or at least with such overtones.

Much the same could be said of Federal power projects. Accounting methods and investment-base allocations hide the facts from the public. The Federal Power Commission and the Internal Revenue Service, furthermore, deprive the tax-paying investor-owned utilities of charging as part of their operating costs the expenses involved in setting forth the facts as they see them—another important liberty which has been lost, not to mention the basic question of freedom of speech and of the press.

Even though the average revenue per kilowatt-hour for residential use has dropped from about 3.8¢ in 1940 to under 2.5¢ in 1960 (while the Consumer Price Index of the BLS has more than doubled) the electric power industry and its suppliers have political and economic climate problems.

The rise of the intelligent, articulate conservative (not reactionary) movements as *Young Americans*

for *Freedom* on many college campuses, a growing conservative literature (both magazine and books), the development by the Chamber of Commerce of the USA of economic understanding courses and of courses in practical politics—all these as examples are hopeful signs. But the primary purpose of all these movements should be individual self-improvement. We need not less, but more “talking to ourselves.” If you or I cannot in private conversation or on the platform win the argument for human freedom, free men, the free market and the philosophy of limited government with an effective diffusion of power—then you and I need self-education.

Legislation and policies generally which promote competition, increase knowledge of the market, and lead to more effective mobility of resources are not inconsistent with, and they actually improve, the operation of a free economy.

The position of those dedicated to the rule of law and freedom is seriously weakened when they do not stand clearly on the side of more competition in all cases, but this would mean that one's friends and natural allies, on occasion, may be subject to criticism. Our deficiency in stating and defending the case for freedom is the key culprit, it is obvious that *we must improve ourselves first*, before we tackle those who, wittingly or unwittingly, are paving the way for the total-state. This is the lesson we need to learn and then act upon it.

The EEI's Expanded Research Program

By WILLIS GALE, Chairman, Commonwealth Edison Company,
and
Chairman, EEI Research Division Executive Committee



Here are some observations that will present a brief picture of the general policies which EEI is following in the matter of research.

Although our program fulfills a very important need in the area of applied research, nothing the Institute is doing or plans to do is likely to have an earth-shaking impact on the research front. The funds available to us in 1961 are just under \$600,000.

This, although significant, is a very minor part of the total national research effort. According to the National Science Foundation, research and development expenditures in the United States in 1960 totalled some \$14 billion, of which the government furnished about 60 per cent.

It is hardly necessary for me to point out that most of the research for the electric utility industry is done by the manufacturing companies, and that the electrical apparatus research expenditures by the manufacturers are very large.

Although the investor-owned electric utilities are

becoming more and more research-minded each year and themselves, in total, spend a great deal more than the Institute, the basic traditional pattern has remained unchanged.

Most companies are willing to spend a little more money through the Institute. Most companies are stepping up their own programs. Many are involved substantially in atomic projects which, of course, are in the nature of research and development.

On the basis of my limited knowledge of the subject today, my thinking is along the following lines. If I state our policy, as I see it, on the basis of what we ought not do, to a greater extent than on the basis of what we ought to do, it's because it's easier to state that way.

First, our committee is of the opinion that we ought not provide fellowships and broad research grants to engineering schools. We are unanimously in agreement that educational contributions as such should be made directly by the member companies rather than indirectly through EEI. We do, at the present time, have projects which are being handled for us by five universities, namely, Michigan, Massachusetts Institute of Technology, Johns Hopkins, Cornell and Purdue. In these cases, however, we sought out the institution as being the best qualified to do a particular job.

Second, we feel that the Institute itself ought not to undertake to support, either wholly or partly, the general research programs of a particular manufacturer. If the Institute were to become involved in projects of this type, there would be no way to determine where to begin and where to end.

Third, it does not seem practical to get involved in projects where our efforts would be no more than a drop of water in the ocean. Research on fusion would be a case in point. I am not sure that our project on heat storage may not be of this type, although a number of our member companies are excited about it, and, of course, if anything could be accomplished, it would be very helpful indeed.

Fourth, it is a tradition of our industry that product research should be carried on by the manufacturers. It follows that the Institute, as a general rule, should not engage in product research. However, there are cases where our industry needs specialized equipment for which the market is too limited to attract the interest of one of the manufacturers.

Fifth, a further criterion should be that our projects are of interest to a broad cross section of our industry. We have projects on air pollution and also fly ash and slag disposal. Most of our members have problems in these areas.

I have heard it suggested that our industry may suffer in terms of the research which will be carried on in the future by the companies we have relied on in the past for a major part of our technological progress. Although I have no doubt that the individual companies in our industry are taking their responsibilities very seriously—I have not heard of anyone who would like to change our traditional pattern of having our apparatus research done by our manufacturing suppliers. I don't think it will be.



Electric Power's Future Begins At 80

By PHILIP SPORN, President, American Electric Power Company

Only if the electric power industry strengthens its faith in its ability to meet the challenges that must be met to realize its potential future . . . will its future just begin at 80.

The great future of private enterprise in electric power so clearly indicated by our projections is contingent upon our recognition of and proper response to the following difficult challenges that face us, or lie ahead:

1. *Price:* One cannot help but feel distressed by a complacency of attitude that is basically summed up by the following: "Well, we are running the business and doing it successfully; to continue to do this we have to have a good rate of return; and if current profits are not good enough we have to, and so we are going to, raise rates."

I believe this is a deadly attitude for the electric utility industry. I do not mean that rate increases have got to be disavowed as a necessary step to be taken under extreme conditions. But this idea that price is no object, because the service is already a good bargain; or, even, what is the public going to do about it?—none of this is good sense, nor good social-economics, in the United States at any rate.

Many developments may take place that indicate an apparent need to raise prices. It may be that the whole concept of generation—how and where to generate—has gotten into a rut. It may be that the basic concept of transmission is wasteful and inefficient. It could be that the concept of the markets that are available is a limited concept. Perhaps all these fundamentals can be approached in a new way to bring about reductions in cost to avoid increases in price. But to do that we must have strong and well informed active leadership, and this brings me to the second basic challenge.

2. *Leadership:* It was only a short while ago that we were being assured by some of the best technologists that beyond around 225 mw any further increases in steam-electric generating unit size would be faced with a steeply-rising cost per kw. But, in the few years since, we have rather quickly and quietly come into the era of 1000 mw in a single unit. And with this, the era of 1000 mw at a single plant location has come and has hardly had time to take a bow before it has been pushed out of the way to make room for the 2000, 2500, or 3000-mw plant.

The economies that these developments make possible have opened up new vistas in mass generation.

I not only refer to the need of leadership to push

and enlarge these developments further by aiding and stimulating new ideas in MHD generation, or unusual concepts in nuclear power; but I refer to the obvious need of leadership in developing and extending extra high-voltage networks at 345,000 and higher voltages; to leadership in many other aspects of our industry.

I want to single out one particular phase of our business that literally cries out for bold and aggressive leadership—the *field of electric energy utilization*.

The single-energy source is neither unattainable, nor is it a concept of the future. It is an excellent concept for today. For where? It is a good concept for the residential market. It is a good concept for the commercial market. It is an equally good concept for the industrial market. But it will take a great deal of vigorous leadership—I mean *electrical sales leadership*—to bring it about.

In bringing about new developments in general particularly new technological developments, that may have a pronounced influence on our future, the industry is mature enough to take its destiny into its own hands. If a revolution is in the making let the industry make that revolution, or someone else will make it for us. We in the electric business must be ready to supply electric energy irrespective of the means for its production—whether nuclear, MHD, fuel cells, or any other technology. Indeed, we must take the initiative in pursuing these technological avenues of progress as an intrinsic part of our opportunities and responsibilities.

3. *The Place of Public Power:* Although public power was an element in our power economy before the advent of the New Deal, it was an insignificant one until then. In 1932, for example, the electric energy produced by governmental agencies was approximately 5 percent of the total, but by 1959 the figure had grown to 23 percent. Its growth is not the result of any single factor, nor is it the result of the conversion of the American electorate to the gospel of governmental power.

I think the important thing to remember is that electric energy, being a versatile and, for some purposes, an indispensable tool, offers opportunities for all sorts of agencies in a complex society to get involved in its supply. And lack of alertness to both opportunity and responsibility again and again has accounted for the growth of public power.

I do not mean to say by this that there are not strong political slants to public power. There are, we know, a great many people in Congress and in both parties who are firm believers in more government and more government in power, at least in their areas. But even here the convictions are based on misunderstanding and improper analytical information and can be changed. But the change can be accomplished only by a difficult, always unremitting and earnest effort.

4. *The Ability to Defend Itself:* In a way this is a sales challenge—but an especially tough one—selling the *idea* of private enterprise in power. But not only in public power but in other fields as well, the industry has been and will continue to be confronted with many legislative proposals that would be detrimental to the interests of individuals power companies, of the industry as a whole, and in many cases to the in-

terests of large regions of the country, or even of the United States. In this difficult field of action, there has been less and less tendency for the people of the industry, the heads of the various power enterprises, to defend their positions and their interests vigorously and in person.

To do so effectively means in many cases frequent appearances before Congressional committees. It is possible to convert people in Congress to a point of view with regard to a piece of legislation different from the view they had when it was first introduced, but it takes a lot of hard work and it is no job for mercenaries or the hired men. I do not believe it is possible to have any effective influence in Washington if one stays away from Washington.

5. *The Ability to Attract Youth:* There will be plenty of opportunity for the very brightest people in engineering, in law, in finance, in business, in merchandising and selling, in advertising, in accounting, in the social sciences and humanities to find ample outlet for their abilities and ample challenge on which to sharpen their maturing knowledge and understanding.

But programs for bringing this point of view to the attention of able young people have got to be developed and on the whole the industry has done very little. Unless it does more and does better, it simply

will not have the manpower to even visualize these things that we have been talking about as they develop and come more sharply in focus, let alone the manpower which will have the imagination and understanding to be attracted by the challenges to meet them and to carry through their development.

6. *Confidence in the Future:* The five challenges that I have so far discussed which the industry must recognize and respond to in energetic fashion, are all vitally tied in to a sixth challenge, Confidence in the Future.

If the industry is to do all these things—it must do so on the basis of complete confidence that this kind of program is sound and solid. It must do so with complete confidence that it will lead to great gain in the welfare of the people of the area served, of the country as a whole, and the success of the power enterprise. It must be sold on these challenges—and it must sell these ideas to the nation.

I believe that what the industry will be in the year 2000 is up to us. If the industry accepts its potential future and strengthens its faith in that future and its ability to fully meet successfully the challenges that must be met to realize that potential, only then can it be confident that with all the great history and performance it has integrated in its first four-fifths of a century, its future will just begin at 80.

Future Power Progress Report

By LEONARD J. LINDE, Director of Engineering Services, Allis-Chalmers Manufacturing Company



MHD and Thermonuclear Fusion show the most promise at this time in the non-conventional generating field.

THE imaginative approaches used in the various research programs for power generation have directed the interest of many of our scientists and engineers away from space vehicles or other competitive sciences. These newer research activities in power are actually a broadening of the earlier nuclear-fission programs with many scientific achievements yet to be registered.

Of the less-conventional sources and methods of power generation, there are two that are worth consideration at this time. The first of these is magnetohydrodynamics, that science that treats with the influence of conducting and moving fluids or gases on magnetic fields. This concept shows a cost for power of $5\frac{3}{4}$ mills per kilowatt-hour. We are indebted to the American Electric Power Co., their associates, and AVCO for their early work in this field.

Experimental studies, backing up earlier theoretic

cal work, have already indicated the possibility of burning powdered coal at ionizing temperatures. Such combustion temperatures can be realized by heating the combustion air in unconventional heat exchangers. The majority of the problems become engineering problems of dealing with these high temperatures, designing a proper system, and for generating or converting the useful power to ac.

Allis-Chalmers has maintained an active research and development program in this field for the past several years. MHD Research, Inc., Babcock & Wilcox, Sargent and Lundy and Explosive Research, Inc., have assisted A-C in a detailed design study of an actual 300-mw, MHD power plant. This entire study and all of its details are now being summarized.

Present evaluation shows that a 300-mw plant would have a complete cost of less than \$170 per kw, a heat rate of 6500 Btu per kwh, and that the power would be delivered to the switchyard at a gross cost of 5.75 mills per kwh.

Of equal interest, but not as close to realization, is the research program in fusion power. Though this scientific activity continues to be a favorite subject of our Sunday supplements, it offers to all of us, and to the world, the final almost unlimited source of fuel for low-cost power. The primary fuel for fusion power is heavy hydrogen, deuterium in water. By efficiently harnessing this fusion reaction to a power generator, a few cents of deuterium in a gal of water can satisfy the average householder's power requirements for three years.

But, while the fuel is practically inexhaustible and of little cost, the establishment and control of a fusion reaction are difficult. Gases must be heated to about 500-million degrees to initiate fusion of the nuclei. The reaction must be confined by dense

magnetic fields. An extreme gas purity must be maintained in the reaction vessel.

Of the many active research projects of the AEC-sponsored programs of fusion research, a program recognized as the Sherwood Program, an approach advanced by Dr. Lyman Spitzer of Princeton, has considerable promise—such as the Stellarator project. During the past several years, A-C and Radio Corporation of America have designed, fabricated, installed, and are now completing final tests of a large fusion-research facility for Princeton University. This Plasma-Physics Laboratory, sponsored by the AEC through its Sherwood Program, will direct all of its efforts toward establishing the knowledge for initiating and controlling the fusion reactions of the lighter elements. The final objective will be power from an unlimited source of fuel in the earth's waters.

At the time of this study, economic considerations dictated the minimum capacity of a fusion plant, using the principles of a Stellarator, as 5000 mw. Such a concentration of power might find limited applications in today's market.

New breakthroughs in alloys that act as super conductors, under cryogenic conditions, promise drastic breakthroughs in fusion plant economics. Alloys, such as Niobium 3 tin, that have no electrical resistance at temperatures below 18 degrees absolute are most exciting. Advances in this technology promise Stellarator power plants of conventional size and at conventional costs. All we need is the knowledge of how to initiate a fusion reaction, how to control a fusion reaction, and how to generate power from this reaction. There are no predictions for the date of this accomplishment.



Research . . . and Future Power Transmission

By JAMES F. YOUNG, General Manager, Electric Utility Engineering Operation, General Electric Company



Current research is having an accelerating effect upon transmission developments.

Advances in future power transmission will be accelerated by new technologies growing out of research for other purposes, as well as by research aimed at solving specific transmission problems.

This grown activity promises continuing contributions to improved economy and continuity of power transmission. In general, one can expect heavier line loadings, increased use of double-circuit lines, terminal equipment of larger and more economical unit sizes, and an accelerating trend to higher transmission voltages.

Today, considering the world-wide interest in EHV and the international exchange of technical know-how, savings should accrue to all participants if research and development were directed toward one common voltage level, instead of two, as the next step. It is prudent therefore to suggest that 500 kv be considered for both international and American standards. Present trends indicate this voltage will be used in the United States by 1965, with good prospects for 700-kv applications by 1975.

While a-c overhead transmission voltages are resuming net growth of about 4% per year, American interest in d-c transmission has been re-awakened by recent activities in Sweden, Russia, England and France. Present equipment and technology, however, require point-to-point transmission distances of 500 miles or more, before economy favors d-c.

Metropolitan underground cable applications are another matter, since rights-of-way rather than distance may be the limiting factor. An economic comparison of moving 500 mw by 230-kv ac, compared with plus and minus 200-kv, d-c cable, indicates d-c costs more up to an economic break-even distance of approximately 40 miles. Terminal equipment improvements, and the promising a-c cable research at Cornell University, may tend to reduce costs of both approaches; and a new future balance point could well justify a metropolitan cable circuit as the first economical installation of d-c transmission in the United States.

Progress in improving the economy and the continuity of future power transmission is also being furthered by a number of supporting research projects. Most of them deal with phenomena which are not well understood, or on which further knowledge and understanding will serve to improve future

transmission line design and operation.

One example is lightning. Some recently-designed extra-high-voltage lines have turned out to be more vulnerable to lightning than predicted.

Some of this research includes field measurement of response to actual lightning strokes.

Switching surges have become of paramount importance in the design of reduced levels of insulation for high-voltage lines, stations, and apparatus.

Progress is being made in understanding and predicting the magnitudes of corona loss and radio or television interference.

Towers represent such a large part of EHV line costs that even small design refinements and improvements can be important.

One persistent problem is prevention of ice and sleet on line conductors without taking the lines out of service. Another is the galloping conductor.

Knowledge acquired from present plasma research and magnetohydrodynamics experiments offers prospects for improving lightning arresters and circuit breakers.

Solid-state devices, like transistors, have found

their way into many powerline, microwave communication, and station equipments, where they promise smaller size, lower power requirements, and higher reliability.

Use of information theory and operations research, together with computing machines, are providing a basis for advancing power systems planning, coordinated design, and optimized operation.

Materials research has brought improvements in magnetic steels, special alloys, insulations, ceramics, and other materials.

Wireless transmission may develop microwave beam transmission for short-distance situations.

Through all research in this area there is a significant pattern of integrating laboratory work, analytical work, and field experiment. This pattern emphasizes the common interests of utilities and manufacturers in power-transmission research. While each separately undertakes timely projects for which they are uniquely equipped, and in which they can uniquely employ the results, there is a significant segment of research that can be purposefully attacked only with combined resources.

Distribution— Area of Opportunity

By DR. J. A. HUTCHESON, Vice
President in Charge of Engineering,
Westinghouse Electric Corporation



Major breakthroughs in distribution are imminent via the digital computer; the future—invisible, outage-free, automatic systems.

We have historically given more thought to, and put more of our resources behind, improvements in generation and transmission. Those are the areas in which we had the most to gain through research and development; and I'm sure we are all convinced that these efforts have been, and will continue to be, immensely rewarding. However, you have to deliver your product to the point of sale, and you have already invested \$20 billion in distribution systems to do it. Moreover, in the next 20 years, the nation's investor-owned companies will pour another \$40 billion into distribution.

As I see it, there are two jobs to be done. First, we must continually upgrade our present systems by taking maximum advantage of existing knowledge and improved hardware. And second, we must turn our full attention to a program of research which studies the total function of the distribution system, and takes advantage of modern analytical techniques to evolve basic new methods of approach.

In addition to equipment developments, joint studies by manufacturer and utility teams have led

to development of new types of systems. The 460-volt secondary incorporating spot network radial design, the brain child of such a partnership, can reduce commercial distribution investment by 10 to 20 percent compared with the conventional network. Network growth in many major cities has benefited from such studies.

The next logical step, under study and experimentation, is higher utilization voltage for residential distribution. By stepping up from 120 volts-to-ground to 240, you will be able to utilize transformers four to ten times the ratings of present systems. Studies indicate that this should result in an over-all system savings of 15 percent.

Fortunately, we have available techniques and tools of research equal to the enormity of the problem of designing and developing optimum distribution systems. This new tool is called "Operations Research," and utilities are experimenting with it.

Basically, Operations Research sets up a mathematical model of the system or operation under study on a digital computer.

Such things as circuit loadings, voltage drops, and losses are expressed as simple equations . . . and the solution of these equations make it possible to choose the most economical system voltages, substation sizes, and circuit configurations for as many alternatives as desired.

So you see, we are on the threshold of major breakthroughs in the field of distribution.

What's likely to come of it?

Well, let's step ahead into that community of tomorrow on the Total Electric Frontier and study the distribution system. Looking down a residential street in the fashionable suburbs, we notice at once the absence of wooden poles, cross arms, and service paraphernalia. One overhead line joins the street lights, and that seems to be the only visible evidence of electrical distribution. This impression is correct, as it turns out, because we have combined functions.

In the base of street lighting poles, we have integrated the distribution transformers. Service to homes is underground.

In another section of the city, even the overhead cable has been placed underground. This wasn't as expensive as you might think, since improvements in cable design and insulation did away with the need for concrete ducts and manholes.

The unassuming installation inside the garage is the watthour meter. It is a static-state device which contains no moving parts. Even more important . . . the meter is read from a remote center automatically. At that center, a computer figures the bill and sends it out. It also records demand and energy use from individual meters and monitors distribution transformers and circuit loadings, as well as voltage drops. The same computer records the history of energy use, and predicts future changes in system design that will be necessary to keep pace with loads.

Meanwhile, back at the main office, a master computer is receiving information from the sub-computers, and constantly optimizing the system. The system planning engineer is an apprentice from the local trade school. His principal duty is to bring the output sheet from the computer to the president's office every morning. The output sheet tells the president at a glance what the revenues are, what they will be at any given time in the future, what changes will be necessary to keep up with demand, and what it will cost to make them. Of course, service interruptions are unheard of. In case of a

fault anywhere in the system, monitoring computers instantly redirect circuits to maintain service and, pinpoint location of trouble.

So you see, distribution is no problem in this Total Electric World. Costs of the system have been drastically reduced because every addition to the system was predicted years in advance, and every dollar spent produced optimum results.

Fantasy? No indeed. The error, if there is one, will inevitably lie in the conservatism of these predictions. There is nothing in this distribution system of tomorrow that we could not, with a little effort, build for you today.



Will Russia Catch Up?

By EDWIN VENNARD, Vice-President and Managing Director, Edison Electric Institute

In the use of electric energy, Russia will not overtake us in the foreseeable future—but this outlook is no cause for complacency.

It is generally known that in the United States we now use more electric energy and have more power capacity than Russia, but what about the rate of growth? Will Russia catch up? Will she cross us? After weighing a number of factors, it is my considered opinion that:

1. The long-range electric energy use in Russia will be less than that in America.
2. The gap between American and Russian use which has been widening will continue to widen, and therefore,
3. Russia will not overtake us at any time in the foreseeable future.

Let us review the status of the two nations in terms of electric power. Last year kilowatt-hour generation in the U. S. (including Alaska and Hawaii) was 844 billion compared to Russia's 275-billion. In capability we had approximately 192-million kw in 1960 compared to Russia's 65-million.

Of at least equal significance is our lead in terms of transmission lines 35,000 volts and above. We have 304,220 miles of such line compared to 62,877 miles for Russia. Our transmission system is almost five times as extensive as that of Russia.

The vital comparison lies in kilowatt-hours per capita. This is the end result toward which both power systems are directed. (Chart 1.) In 1960, the estimated use was 4,716 kwh per capita in the United States. In Russia it was less than a third of that—1,322 kwh. Russia's latest forecast puts the figure at 3,000 kwh per capita for 1970, when ours will be around 7,500.



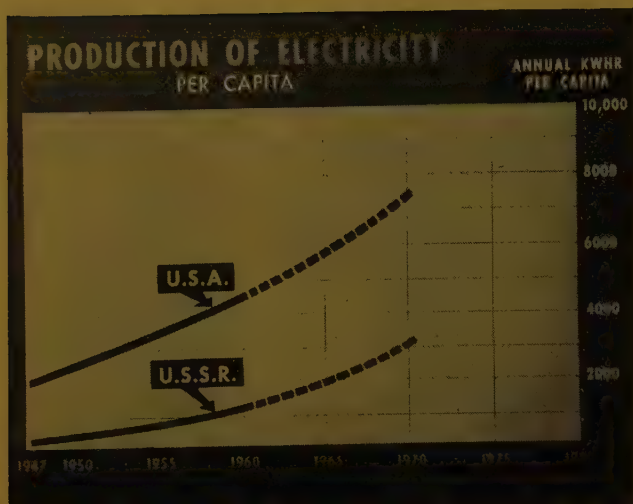


Chart 1

Let us examine the trends in the rate of use of electrical energy in the two countries.

During the period from 1930 through 1960 the energy growth rate in Russia was 10.4-percent per year, as shown on Chart 2. The Edison Electric Institute for the U. S. to 1960 is also shown.

In Russia, goals are set. They are not forecasts in the sense of our projections. Shown on Chart 2 are Russia's goals for 1970 and 1980, announced by Khrushchev in 1959. In the past, Russia has failed to achieve many such goals.

Russia is now extending service to customers who previously were without it, much as we were doing during the period 1915 through 1930. Also, Russia is electrifying industry now as we were doing in this period.

America's rate of growth in energy use during the 1915-1930 period averaged about nine percent per year. (See Chart 3.) If in 1930 we had used that trend in making a forecast we would have predicted 1,582-billion kwh for 1960. If we had taken the trend between 1921 and 1929, we would have arrived at a

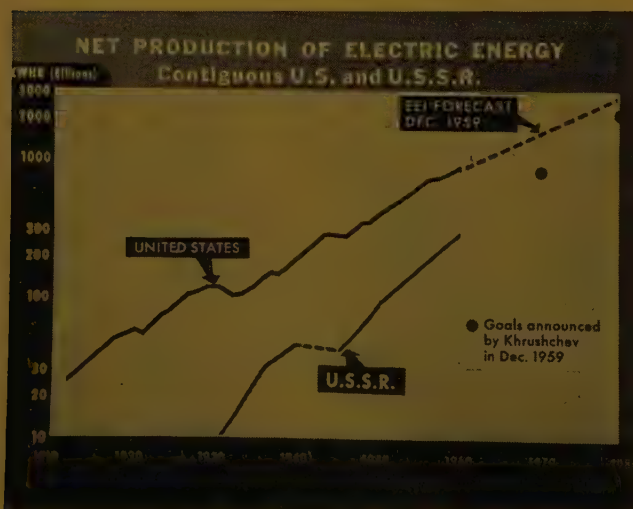


Chart 2

figure of 2,468 billion in 1960. As our system grew, its characteristics changed. Such change is an inevitable mark of progress in the development of a comprehensive power system.

In forecasting Russia's future power use we should avoid the error of ignoring similar changes which will likely take place as Russia's power system evolves from its present state.

Over the past 10 years or so, Russia has been on a war economy as far as production is concerned. We operated on a somewhat similar basis from 1938 through 1944. During that period the rate of increase of energy use in the U. S. was 12.5 percent per year. If in 1944 we had made a forecast based on the 1938-1944 trend, we would have arrived at a figure of 1,924 billion kwh in 1960, while the actual figure was 840 billion kwh. (Chart 3.)

Russia's trend line will likely change after Russia has extended service to all existing households and farms and when new customers added to the system are principally the result of population growth. The trend line will change further after Russia has progressed in the mechanization and electrification of industry as we have done here. Then the growth line, in

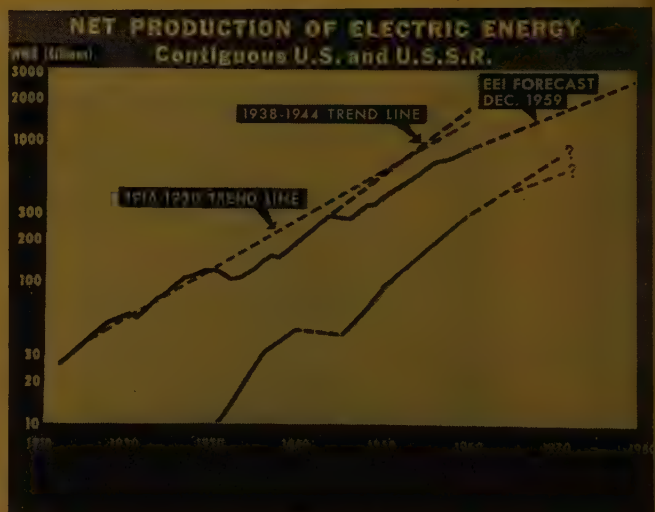


Chart 3

Russia as it is here, will be influenced in the main by the development of new industries and the production of new things.

Does this appraisal suggest we become complacent? Hardly. But when all power demands are met with satisfactory reserve, building additional reserve will not make the economy grow faster.

All of the power capacity to meet America's electric power needs (not just the 80 percent served by the investor-owned industry) could be financed in the free market. There is no need for the government to spend anything for America's power needs. This is something for Americans to ponder in light of the present high demands for government spending in other categories.

The All-Electric Future

by J. K. HORTON, President, Southern California Edison Company



Many challenges face power companies as they move to capitalize on the tremendous potential of the all-electric future.

Investor-owned utilities will need to exercise all possible ingenuity and perseverance in research, marketing and practical politics if they are to maintain their key role in the all-electric future.

Our industry must sell not only products, and services, but also ideas—and ideals. Everything from heat pumps to free enterprise. It is impossible to lay down firm rules for covering this broad spectrum. We must remain flexible and alert. In general, it may be said that the soft-sell, or subtle sell, has replaced the old hard-sell at the consumer level—just as the old-fashioned melodrama has been replaced by more realistic drama in our theaters. People's tastes have changed; they have become more sophisticated. They resent having their intelligence insulted.

But there are areas, still, where the exigencies of time and fierce competition require an extremely hard-driving, if not high-pressure attack. I am thinking, for example, of the competition in our own area to sign up Medallion builders—to convince them, against intense competition, that their own self-interest demands that they go all-electric in their housing tracts. Most builders are not pre-sold. They are open to the best argument—and the best offer.

So far as I'm concerned, the Medallion Home Program is the happiest development in electricity—from the sales point of view—since Ben Franklin took up kite-flying. In developing standards of excellence in wiring, lighting and built-in appliances for Bronze Medallion Homes and in setting up even higher standards for "total electric" Gold Medallion residences, the electric industry has rendered a service to builders as well as to the general public. For builders, it has provided a valuable sales tool—and for the public, it has offered an easily recognizable hallmark of quality.

During 1960, as a direct reflection of the Medallion program, our company experienced the largest increase in residential consumption in its history. About one out of every four Medallions issued in the country were in our service territory—and 25 percent of all new dwelling units authorized by building permits in our territory were planned to meet Medallion standards.

Although the use of electricity on the farm has more than doubled in the last 20 years, we still have a long way to go in realizing our potential.

We no longer have barns—we have "milking parlors," complete with soothing music and red lights that blink when a cow has been properly milked.

One California farmer devised what I understand was the first completely-automated poultry farm, on which he alone can take care of 30,000 chickens. Once installed in their all-electric homes, the chickens are not only watered and fed automatically, but even the eggs they lay are electrically gathered. Furthermore, the area beneath the pens is electrically cleaned—which eliminates perhaps the largest single drawback to the profession of poultry raising.

Our agricultural department also has been working with Southern California farmers to help develop a system of growing tomatoes in the winter-time under plastic tents, using heat pumps to control both temperature and humidity. Under this system, moisture given off by the plants is condensed and used to help irrigate those same plants.

Also, donations from electric utilities in our area are being used in a research program aimed at developing a conveyor-belt system for crushing grapes to make wine. The juice is said to be of better quality because the pulp of the grapes is carried away before imparting a bitter taste.

These are but a few examples of the growth of automation on our farms. The farmers, themselves, are proving ingenious in finding new ways to adapt electricity to their needs. All we need to do is work with them and help them find solutions which will be profitable for all concerned.

Taking a cue from the nation-wide success of the Medallion Home campaign, our own sales department recently developed what it calls an "All-Electric Building Award Program." Its aim, of course, will be to promote greater acceptance of the all-electric concept by the designers, owners, and operators of commercial buildings.

Still another field in which we have by no means reached our sales potential is in commercial and street lighting. Research statistics have demonstrated clearly that as foot-candle illumination goes up in our office buildings and factories, there is a corresponding increase in efficiency. And as illumination is increased on the streets of our cities, accidents and crime are decreased.

One thing is certain, regarding research: we, the electrical industry, must do it *first*, and *best*—and we can't afford to let our competitors, the producers of alternative sources of energy, take the initiative away from us. There will be others who will be quite willing to devise better methods of generation if our industry does not do the job.

Let me conclude as I began—with a firm belief in the all-electric future. But let us remember this—while the future will be all-electric, it will take all of our ingenuity and perseverance in the field of research, in the field of marketing, and in the area of practical politics for the investor-owned industry as presently constituted to maintain its role in that great future.

Live Better Electrically

By WILLIAM M. SHEPHERD, Vice-President in Charge of Sales, Arkansas Power & Light Company and Chairman, EEI Live Better Electrically Policy Committee



Now in its third year of sponsorship by EEI, the Live Better Electrically Program is demonstrating increasing effectiveness.

Great progress has been made in the two and a half years of EEI sponsorship of the Live Better Electrically Program. We are making even greater progress in 1961. But there is much to do ahead before we achieve the full stride in promoting electrical living.

Early in 1960, Live Better Electrically undertook a comprehensive motivation study of American householders in 11 markets scattered around the country.

From our research, we learned these things:

1. Our ads must be believable, picture a believable mother using an electric appliance to benefit her family.

2. And the ads must draw a distinction between gas and electric appliances, giving the family a reason for buying electric over gas.

When we researched electric house heating some 18 months ago, we learned that the majority of people in this country were totally unaware of it.

Last March in Chicago it was proposed and approved that the Live Better Electrically staff go ahead with a research project which will take interviewers to 15 markets around the nation, so that we may make an even further probe into the likes and dislikes of people in terms of electric housing heating. We want to measure their awareness, their attitudes toward costs, their reactions to electrically-heated homes they may have already seen. We want to know why they bought electrically heated homes . . . and just as importantly, why they didn't. The results of this body of research will influence the direction of our 1962 advertising on this subject. We know we have a good property in our current advertising approach. We'll now see if there's some way of making it sharper, more effective, more profit-producing.

Live Better Electrically has a separate campaign featuring builders who build Medallion Homes. These men testify to specific reasons why they put electric house heating into the homes they build—to save money for themselves, to build better homes, to sell them faster, to guarantee more customer satisfaction.

Here's how local utilities have been using the Live Better Electrically promotion materials:

70 companies have purchased well over \$100,000 worth of window banners and other point-of-sale materials.

Utilities have purchased over 60,000 reprints of LBE ads for display in showrooms, offices, dealer

meetings, and as mailing pieces.

84 utilities are using artwork from the Live Better Electrically ads for their own local ads, getting beautiful, high-quality artwork and saving themselves the great expense of additional photography or art.

During 1961 there will be 42 double-page spreads, 13 of them in color; and 23 single-page ads—a total of 65 insertions for the year.

One of the primary purposes of the Live Better Electrically program is to develop basic advertising themes and encourage utilities, manufacturers and our many allies to use them in their own advertising. This has the effect of multiplying our own direct investment in Live Better Electrically, but more than that, it gives the electric industry a common sales theme and a program of cooperative sales effort that we have never had before. This is Live Better Electrically's role as an industry leader.

How is this working out? The local investments of Live Better Electrically member companies—the amount of money these utilities will invest this year in advertising time and space—total \$30,521,000. These utilities will invest another \$102,000 in point-of-sale materials purchased from Live Better Electrically.

In the last year, we have told the Live Better Electrically story at more than 75 meetings and before more than 15,000 key industry people.

To assure the continuity of the Live Better Electrically program, two new research projects are now in the works: one on electric house heating; the second, a basic consumer attitude study. We are successfully placing the majority of our funds right where it counts—in advertising space, a fact made possible by good staff management. We are making friends and moving ahead in all ways. The start made so auspiciously in 1960 with our key word "flameless" is continuing in 1961, and it will continue to be our theme into 1962.

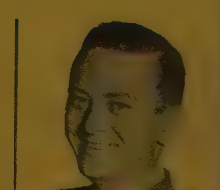


Atomic Futures

By MAJOR GENERAL K. D. NICHOLS, U. S. A., Retired, Consulting Engineer, Washington, D. C.

Atomic power competitive with fossil fuels in high-cost areas can be achieved prior to 1968, if proper decisions are made . . . and early in the 1970's atomic power should be competitive in the medium-cost areas of the U. S.

Real progress is being made in achieving economic atomic power. Specifically, we can achieve atomic power competitive with fossil fuels in the high-cost



A discussion of Elements in Financing the Industry's Construction Program by this panel of specialists included expressions of these views (l to r)—C. B. DELAFIELD (moderator): Our financing job is not very simple; G. W. McKINNEY: Ahead is a period of strong economic expansion; E. B. CHUTTER: Dividend action will make any stock "growth stock;"

E. B. WHITE: Regulatory commissions should look again at compensatory balances; C. GLAVIN: Seek flexibility in financing; W. A. DOYLE: Lean toward stock offering. (A report on this convention panel presentation will appear in EL&P, July 15 issue.)

areas prior to the Atomic Energy Commission objective date of 1968 if proper decisions are made at this time. Further, there is every reason to believe that early in the 1970's atomic power should be competitive not only in the high-cost areas but also in parts of the medium-cost areas of the U. S.

Looking at the short-range prospects first, only the water reactors, gas-cooled reactors, and water-cooled graphite reactors that have reached the point where sufficient data are available now, both from a construction and operation point of view, to base sound estimates of cost for producing power. (In comparing atomic powerplants with fossil-fuel plants I have considered annual fixed charges at 14-percent and the use factor at 80-percent.)

The progress made in water reactors is encouraging. Technological progress is such that we can attain a successful accomplishment of the Atomic Energy Commission short-range objective of competitive atomic power in the high-cost areas on or before the 1968 target date. Whether or not we do attain this objective depends more on administrative and political factors and the support of investor-owned utilities rather than on technical factors. The necessary plants can and should be constructed and every support should be given by government and industry to see that they are constructed.

Looking at the long-range picture, I am reasonably optimistic that atomic power will make considerable inroads into the 25¢-35¢ per million Btu or medium-cost fuel areas in the early 1970's. From the standpoint of the atomic power industry this accomplishment would be a real achievement because it would open up about half of the utility market. Looking at a 10-year period from 1970-1980, it is reasonable to assume that 10-20 million kilowatts of powerplants of a size of 300-megawatts or over will be built in the high-cost 35¢ per million Btu area, and 40-60 million kilowatts will be built in the medium-cost 25¢-35¢ per million Btu areas. Certainly if the atomic industry can capture all the large plants in the high-cost area and a part of the large plants in the medium-cost area there would be sufficient market to sustain reasonable development of the art and development of manufacturing techniques.

I have little doubt that from a technical point of view we can attain the progress needed. The best method to attain this progress is more difficult to predict. Certainly in the water reactors we can attain many more improvements by research, development and engineering, and also additional economies can be attained just by increased size alone. Plants from 500-1,000 megawatts using dry and saturated steam, although this horrifies some of our advocates of more efficient steam cycles, appear to be feasible. Likewise, it can be expected that progress will be made in developing atomic superheat. A combination of a large base plant with a separate atomic superheat plant may turn out to be most economic. Later integral superheat or some variety of pressure-tube reactor may turn out to be better.

In the gas-cooled types of reactors we should be able to use higher temperatures coupled with enriched and improved fuel to improve the economics. Likewise, progress may be made with the sodium-graphite system, particularly in large sizes, and the organic-moderated. The fast-breeder cycle may turn out to be the best way to utilize plutonium and certainly will have its place ultimately as a way to get the most power out of available supplies of uranium.

One of the big problems facing the utility history is that no one reactor type is the obvious or final answer to the most economic power. Care must be taken that the utility industry does not scatter its support too widely. Care must be taken to insure that only the number of projects that the industry can adequately support are undertaken. There should be a follow-through on concepts well along to develop the most information and experience from them rather than jumping too rapidly to the support of promising but little-advanced projects. Also, a greater effort must be made to develop all aspects of the fuel cycle. An integrated power industry must ultimately be able to use plutonium U_{233} as well as U_{235} as a fuel.

We must recognize that atomic power is competing with a moving economic target. No one expects that technical improvement in fossil-fuel plants will cease. We are constantly building larger and larger and more efficient conventional plants.

Tomorrow's Managers

By RALPH M. BESSE, President, The Cleveland Electric Illuminating Company



Tomorrow's managers will be only competitive with the best managers in our industrial system if the top executives of today assume personal direction of specific programs to achieve the best in management.

The job of tomorrow's managers will be vastly more difficult than the job of today's managers. Our companies will be bigger, our technical requirements will be more difficult, our competition will be more intense, and the growth in complexity of our over-all operation will accelerate.

To perform the management function in such a matrix will require better people better trained.

Fortunately the methods of upgrading the management of a company are known to modern industry. And although they are simple to state, they are hard to apply. The varied challenges to our industry are such, however, that we must aim at accelerated improvement of the competence of our managers. This can only be done by the establishment in every company in our industry of a carefully developed plan of action conscientiously administered.

An effective plan for long-range managerial improvement must include these things as a minimum:

First, a company audit and analysis of the current status in management planning and future needs in management.

Second, a careful analysis of the organizational changes and developments expected over the long-range future term.

Third, a definition of the qualifications of tomorrow's managers.

Fourth, a method of recruitment designed to obtain a full share of the intellectual competence of every graduating class.

Fifth, an established system of internal selection designed to move the best people in the organization to the top and to eliminate inadequates.

Sixth, a program of development designed to maximize the qualifications of the best people for the growing requirement of effective management.

In developing an optimum management team, another important requirement is the establishment of a system to insure that the best-qualified people in the entire organization are selected to fill job vacancies as they occur. Such a selection should include at least these things:

1. It must be based on a formal, well-adminis-

tered system of annual appraisals designed to identify to management the merit, performance, and relative ranking of all candidates for promotion.

2. Adoption of the objective that all vacancies should be filled by people who are better than those being replaced.

3. It should be the practice to select the best-qualified candidate in the company to fill a vacancy regardless of the line of promotion he happens to be in at the time the vacancy occurs.

4. It should be the practice to move inadequate out of supervisory positions as soon as inadequacy is demonstrated.

As with most planning, the beginning must be the formulation of objectives. We are not apt to reach a goal if we do not know what the goal is. We are not apt to develop managers if we do not know the number, type and quality we need to develop.

The next step is to catalog, study, and make available the methods of management development and then, to train the organization how to select and use them.

A continuous program should determine what individual personnel strengths and weaknesses are, how the strengths can be encouraged and the weaknesses eliminated. It is highly unlikely that any organization is good enough to achieve this result for its people if it does not have a specific system established to get the job done.

Underlying all of this is a need for sound incentives. The competition for the best-qualified managers of the future will be more intense than any competition for managers we have yet experienced in our economy. A carefully developed and continuously supervised system is required. It ought to be in writing and it ought to include all the basics of good salary administration, as well as the special incentive features needed to make it competitive.

A sound salary structure alone will not insure success in attracting and retaining a proper share of tomorrow's managers. To be competitive, a well-rounded compensation program must be provided. Consideration should be given such things as: (1) pensions, (2) group life insurance, (3) deferred compensation, (4) bonuses, and (5) stock options. This is what manager market requires, and we must remain competitive with the market or be content to run a second-class race.

Tomorrow's managers can be as good as today's managers care to make them.



World's Fair Progress Report

By ERNEST R. ACKER, Chairman of the Board, Central Hudson Gas & Electric Corporation and Chairman, EEI World's Fair Committee; President, Power & Light Exhibit, Inc.



The Fair will expose progress under competing ideologies, a competition we must meet and win.

THE over-all theme of the 1964-65 World's Fair in New York is a basic factor in determining the character of our exhibit and its most significant element is stated in this way: "The Fair is dedicated to man's achievements in a shrinking globe in an expanding universe, his inventions, discoveries, arts, skills, and aspirations."

But Robert Moses, President World's Fair Corporation, has called attention to an important additional aspect of the Fair: "Today a Fair is not only a place to exhibit and see the finest and most modern and significant products of the imagination and skill of all the nations, but a forum in which national ambition and ideologies are combined and fully exploited and promoted. We must be prepared to meet not only the challenges of the nations of the free world, but also the competition of Soviet Russia and its satellites who will make every effort to prove in this world forum that they are at the very forefront of progress, and that their totalitarian system is capable of doing more and better things for mankind than our democratic system of enterprise. This is the kind of competition that American industry must meet."

This is the philosophical or the ideological setting of all exhibits at the Fair. It will be truly international—some three dozen countries have thus far accepted invitations to participate—including Soviet Russia—and here it is worth noting that this Fair will come just three years before a Soviet-sponsored World's Fair planned for Moscow in 1967.

On P&LE's site we plan to erect a tower of light based in a rainbow-colored building 80 feet high—the maximum allowable height. From the building's superstructure a battery of searchlights will beam the greatest concentration of light ever generated straight up into the sky. It is expected to be visible as far away as Boston and Washington, D. C. This 24 billion candlepower beacon should help to focus the public mind with great effect on our industry's exhibit—and on the Fair itself.

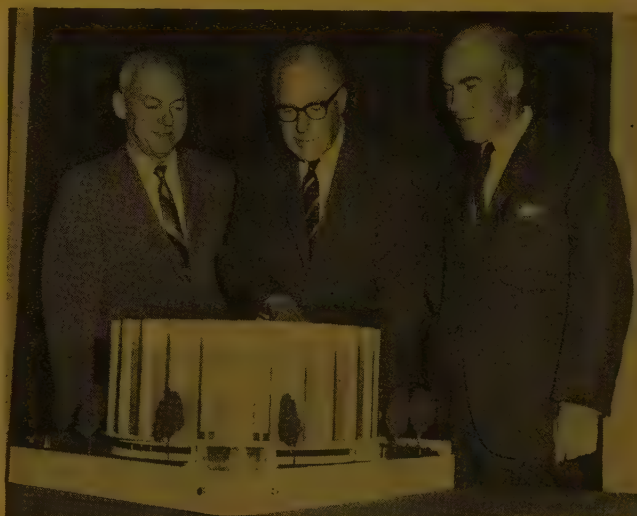
As a guide in the establishment of the final exhibit pattern, we are using seven major categories of displays on which to base our story.

1. A dramatic presentation will be developed to show the great abundance in electric power supply, and various aspects of the system which produces and distributes this energy.

2. The story of research, development, and growth will be presented from Edison's initial pioneering contributions to the great power pools of today.

3. Displays will cover the price record, indicating how the industry's development, under government regulation, has resulted in a remarkable record of lower prices despite inflation and increasing costs.

4. The uses of electric energy will be shown in a



Model of the investor-owned electrical utility companies' exhibit at the 1964-65 New York World's Fair is examined by (l. to r.): Sherman R. Knapp, retiring president of EEI; Ernest R. Acker, chairman of the EEI's world's fair committee and president of Power & Light Exhibit, Inc.; and Philip A. Fieger, newly elected president of EEI.



ALBERT L. COLE,
V-P, Gen. Mgr.,
Reader's Digest



ANDREW HEISKELL, Ch.
of the Board, Time, Inc.

Publishers: Offer Deeds, Simple Story

The electric utility industry has done a noteworthy job for the American people, concede representatives of *Time* and *Reader's Digest*, but they strongly recommend redoubling of the industry's efforts to communicate that fact to the public. Advises *Time*'s Andrew Heiskell: Let your story flow from your industry's sense of purpose; adopt simple goals . . . and a budget that is big enough for the job it must do.

V-P Cole of *Reader's Digest* commented: "The profit you make in rendering a wonderful service to the American people . . . works for the benefit of all . . . I hope it will never be necessary for my family, my business, or any one else in America in the future to have to secure their electric service from any government."

major portion of the exhibit, with exciting examples of applications in the home, on the farm, and in industry and commerce.

5. Financing the industry's growth in the free market will be given significant attention. Included will be displays on the industry's annual investment in new facilities and how it affects various phases of the economy, on the ownership of the industry, and on its tax contributions to all levels of government.

6. America's power supply compared with the rest of the world will form the basis of other displays.

7. The climactic group of displays will be concerned with the industry's plans for the future, including what is expected from research and development.

Our basic purpose will be—to make sure that when

a visitor leaves our building, he is convinced as never before that our industry is vitally concerned with his well-being and that we can be counted on to continue to provide the best in electric service for his benefit now and in the future.

Because every electric company in the nation will be benefited by the P&LE exhibit at the Fair, we are now seeking, and counting on, the widest possible financial support for this great undertaking. We have here an unparalleled opportunity to make contact with millions of our customers in a truly face-to-face way and, for this reason, we plan to have an exhibit that will be one of the Fair's principal attractions—and that will tell our industry's story as it has never been told before.

Knapp Lauds Edison at Convention

Yesterday, I had the distinct privilege and honor of participating in the ceremony by which Thomas Alva Edison was inducted into the Hall of Fame. It was an impressive ceremony in which many notable people took part. My brief role as a representative of the Edison Electric Institute consisted of the presentation of the Edison bust. (Following are some of Mr. Knapp's comments at the presentation.)

"For thousands of years before Edison developed the first electric light system, men had lived without the countless conveniences electric energy has given us. In less than a century, electricity has wrought great changes which have advanced our whole life and kind of living. But these momentous developments were not accomplished by the waving of a wand, no matter how magical the contrast between then and now may appear. Human imagination, thought, and effort on the part of millions of people brought about the benefits from the mighty force of electricity.

"What we have seen in the first phases of electrical progress is marvelous enough. What may come in succeeding phases may well be beyond our present ability to comprehend, but it is not beyond man's power to create."

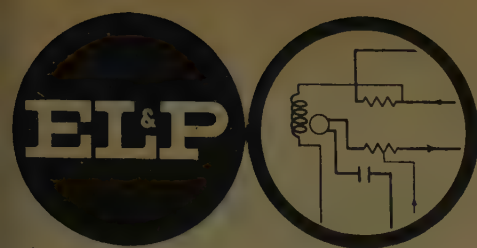


EEL's Edwin Vennard, left, greets Detroit Edison's Walker Cislér and Harvey Firestone Jr. at induction of Thomas Edison into Hall of Fame.

We most frequently think of Edison in connection with his various inventions, particularly the incandescent lamp. While undoubtedly invention of the lamp contributed importantly to the development of the electric utility industry, I believe that other activities of Thomas Edison were more directly responsible for the development and growth of this great industry.

It is clear from reading Mr. Edison's biography that he had in mind from the beginning the whole system of generation, distribution and utilization of electricity as a complete business. Development of the incandescent lamp was an important and, in fact, an essential part of the complete system, but without Edison's over-all concept and realization of the economic potential of the electric power business, we would be a long way from where we are now. At the time of his death in 1931, just 52 years after the invention of the incandescent lamp, our industry had grown from nothing to a business with an investment in equipment and facilities of about \$14 billion. Now, 30 years after his death, investment of the investor-owned companies in our industry has more than tripled to a total of over \$46 billion.

Edison deserves a full measure of credit as the founder of the electric utility industry. But he and many others who contributed to the industry's subsequent success as an important element of our free enterprise economy owe a great deal to the form of government under which they were permitted to operate. The early days of the formation of the Edison Electric Light Company involved many discouragements, but at least he was not faced with the problems of Federal government competition and harassment which would undoubtedly have allowed his progress materially, or perhaps stopped it altogether because of utter frustration. Incidentally, I think Mr. Edison would have been thrilled by today's Live Better Electrically Program which features the word "flameless." In this connection I would like to quote the headlines from the front-page story in the *New York Herald for Sunday, December 21, 1879*: "EDISON'S LIGHT THE GREAT INVENTOR'S TRIUMPH IN ELECTRICAL ILLUMINATION . . . A SCRAP OF PAPER . . . IT MAKES A LIGHT WITHOUT GAS OR FLAME, CHEAPER THAN OIL . . . SUCCESS IN A COTTON THREAD."



ENGINEERING-OPERATIONS

Remote-Control Wash Rig . . .

This new remote-controlled wash rig has joined two other rigs of California Electric Power Company to help combat contaminants deposited on insulators by smog. The rig is equipped with high pressure pumps and nozzles, spraying chemically pure water



Remote-controlled insulator washing rig of California Electric Power Company sends jet of chemically-pure water under high pressure to clean porcelain. Right, operator controls unit from drive position.

at 750 to 800 lb/sq in. in a pencil-thin jet which breaks loose any dust or contaminant and carries it off.

Known as a Fabco Hy-Gy (for high geyser) the unit is controlled from a cab equipped with overhead glass and its own windshield wiper. The boom is telescoping type extending 65 feet.

Economic Thickness of Thermal Insulation . . .

A practical means for specifying the exact thickness of thermal insulation needed for maximum economy has been announced by engineers of the Union Carbide Chemicals Company. The system is said to be applicable to any type of heat-using industry.

By referring to charts rather than working out laborious formulas, an engineer can quickly find the solution to almost limitless combinations of variables involving cost of heat energy, insulation, capital, and conductivities of insulations. The formulas and tables will be published by the National Insulation Manufacturers Association in a revised edition of the "Manual on Economic Thickness of Insulation for Flat Surfaces and Pipes" for general distribution.

Generating Efficiency Still Improving . . .

A milestone in generating efficiency was achieved last month by Public Service Electric and Gas Company when, for the first time, system monthly heat rate ducked under 10,000 Btu/kwh to 9915. Increased sales and larger, more efficient generating units are responsible for the new record. Historically, system annual heat rate has improved from 17,000 Btu/kwh 30 years ago to 10,515 for the year 1960. Newest unit on the system has a heat rate of 8720 Btu/kwh and presently produces about 17 percent of the system total. Two other units completed last year at Mercer station have a combined rate of 9009 and produce about 45 percent of system output.

Home-made Lightning Bombards EHV Project . . .

Because nature has not provided enough lightning for continuous studies of effects on its Project EHV, General Electric Company now makes it own with an impulse generator which flashes up to three million volts over insulators of the prototype transmission system. Purpose of the testing is to determine



Three million volts flash over insulator string as G-E engineers study effects of lightning strokes on apparatus used on Project EHV. Surge generator is within dome made of white nylon.

attenuation of impulses, measure effect on station apparatus, and obtain results of special tests on insulators and other components. Lightning bolts are being applied at one or two minute intervals weekly to provide accurate readings in all kinds of weather conditions. The program endeavors to duplicate conditions that might cause interruptions of service to a commercial EHV line. Test results will be made available to electric utilities planning EHV systems.



EEI Purchasing, Stores Group Seeks Improved Materials Management Efficiency, Measures of It

Utility purchasing and stores men want to stand on their record, even as professionals in many other fields are properly interested in establishing job status in today's increasingly competitive business climate. As in other fields, the big problem is: how to write the record . . . how to get the record read.

Meeting recently in the EEI Purchasing and Stores annual conference, this key segment of the utility operating organization tried again to agree on the extent to which performance in their specialized functions can be measured. Members reporting committee studies to the conference turned up new and impressive evidence of ways in which leaders in their field are "Improving Materials Management Efficiency and Costs"—the theme of the EEI meeting.

But, if there was any conclusion regarding "measurement" of purchasing and stores effort, overall, it seemed to be that the yardsticks and their use must be pretty much the tailor-made choice of each utility organization.

Storesmen reflect a sustained interest in measuring stores performance, concludes ConEdison's Wallace J. Griesmann, who reported for one P. & S. Committee study group. But, he noted, there is a definite switch from an "external" to an "internal" approach in measurement efforts.

Methods which work quite well in particular utility operations are not too readily applied in others, several subcommittee members agreed. And, Commonwealth Edison's Wm. Marks summed up the prospects: "Interchange of measurement methods and data is not promising—there are too many differences (between companies)."

Purchasing specialists tend to agree with the storesmen on the less-than-promising prospects of performance measurement that has significant reliability and is flexible

enough to be meaningful company-to-company. Yet, at least one veteran spokesman for utility purchasing, Alabama Power Co.'s George Cole, says: "It can be done. It shall be done!"

Mr. Cole explained that his organization approached the subject through breaking down the purchase function and related materials management into various phases, allotting values for the "worth" of performance in each of 16 specific areas. In his evaluation, a "saving" is ascribed to each item, ranging from one-percent for "public relations" to one-half of one-percent for such areas as "organization," "records," and "area development," to a quarter of one-percent for "inspection and testing" and "claim handling." The total evaluation is 7¾-percent of the total purchase budget.

Mr. Cole noted that the two-fold purpose of the calculations is to emphasize the opportunities existent in purchasing for both buying personnel and for utility management. Where management is looking more and more for ways and means to offset ever rising expenses, purchas-



A committee vice-chairman, E. J. Martin (left), presided at a session in which subcommittee reports were made by Wm. Hollis and J. F. Estill, Jr., who headed the host group.

ing and materials management are becoming recognized as "vastly undeveloped opportunities," he observed.

But, others in the project group did not share Mr. Cole's conviction that measurements can or would be made. One, W. Y. Cottom of West Penn Power Co., expressed the view that, if management gives indications of being satisfied with purchasing department operations, "why do we worry about an evaluation program?"

Mr. Cottom concluded that purchasing people are actually primarily concerned about performance evaluation by management, with



At one of the Purchasing and Stores Committee's luncheon sessions, Speaker H. F. Staacke, vice-president of Houston Lighting & Pwr. Co., sat between J. F. Estill, Jr. and Committee Chairman Robt. Gear, of the Commonwealth Edison Co. Standing behind them is the '61-'62 committee chairman, A. H. Hamilton, Northern States Pwr. Co. Mr. Gear passed away on June 15, 1961.

such an evaluation considering such aspects as:

1. How well is purchasing operating within established company policies, objectives and procedures;
2. To what extent does purchasing contribute to cost reduction and profit improvement;
3. How do other departments rate purchasing ability—do they have faith in purchasing, or do they specify the vendors and the products to be purchased;
4. To what extent is purchasing informed of planned expenditures;
5. To what extent does purchasing help management develop future plans;
6. How flexible or capable is purchasing in meeting emergency situations.

Another participant in the study and presentation, Delano J. Fitzgerald of the Baltimore Gas & Elect. Co. offered this viewpoint:

"In our estimation, the measure of performance within a purchasing department lies in the judgment of its manager and his intimate knowledge of what is happening within the department, such as how far the Purchasing Department has gone with E.O.Q., (estimated order quantities), how far has it gone with blanket orders, how does the personnel get along with suppliers, which employees assist in providing ideas, and other indicia of good purchasing management."

Mr. Fitzgerald added: "In information such as we prepare in our department of purchasing—for example, the monthly report showing

the number of requisitions handled, the number of orders placed, the number of pending orders, the number of employees, the number of salesmen interviewed, etc.—is only valuable on the basis of a month-to-month or year-to-year comparison. It does little to define the ability of an individual employee. In our reporting to management we furnished an annual statement of extraordinary savings and we also meet annually with the officer to whom we report (currently the company's president) to discuss departmental personnel, including what we call "comers" as well as work levels and other pertinent information. This appraisal is the result of close supervision by the head of the Purchasing Department on a day-to-day basis, with due regard to the number of purchase requisitions handled by various members of the department, inquiries sent out, orders placed and extraordinary acts resulting in savings.

"Again, the figures of one group within the purchasing department cannot be directly compared with another group as, for example, one buyer may be negotiating a turbine generator while another places a large number of orders for stationery items," said Mr. Fitzgerald.

Ordering Procedures Unchanged

R. H. McNeal, reporting for another subcommittee, reviewed current purchasing practices. The Cleveland Elect. Illuminating Co. purchasing official suggested that

"ordering procedures have not changed to any great extent over the past 10 years." He noted that a survey of utility operations revealed these prevailing practices:

1. Some 85-percent of the companies surveyed commit the entire order quantity to the vendor or vendors at one time.

2. There appears to be a trend away from "local" orders and local order forms are not as widely used as in earlier practice.

3. Closer control of "blanket" orders is evident.

4. "Cash-and-carry" purchases are not used extensively.

Mr. McNeal identified these suggestions for better purchasing practice:

1. Purchasing and stores people should jointly develop procedures for ordering like materials.

2. Extended delivery schedules, which are helpful to vendors, can be helpful in assuring on-time deliveries.

3. Release activity from blanket order authority should be delegated.

In a discussion of "Practical Material Forecasting," George A. Remalia of the Duquesne Light Co. described a project group questionnaire that aimed at recording practices utilities employ to gauge such "unstable" factors as: use, lead-time, "new," etc. In successfully forecasting material requirements, these methods and practices are most frequently utilized:

1. Advance notice—in conjunction with construction schedules, etc.



In this group of program participants who met at the EEI Purchasing and Stores Committee conference are, l to r: A. H. Hamilton, Northern States Power Co., and R. H. McNeal, Cleveland Elect. Illum. Co. (seated); and (standing) Robt. F. Connolly, Tampa Elect. Co., D. E. Nesbit, Duquesne Light Co. and C. J. Magnesen, Commonwealth Edison Co.



Another speaker group getting acquainted at the Purchasing and Stores sessions includes, l to r: Wm. S. Marks, Commonwealth Edison Co. and W. J. Griesmann, ConEdison Co. (seated); and (standing) C. V. Myers, Philadelphia Elect. Co., Geo. A. Remalia, Duquesne Light Co., and W. H. Brueggemann, Wisconsin Elect. Power Co.



A Purchasing and Stores subcommittee which studied the possibilities for measuring purchasing performance included, l to r: Aaron E. Stant of Potomac Elect. Pwr. Co., W. Y. Cottom, West Penn Pwr. Co., John C. Herbert, Potomac Elect. Pwr. Co. (standing) and D. J. Fitzgerald, Baltimore Gas & Elect. Co. Mr. Herbert served as chairman of the group,



and Mr. Stant acted as moderator for a panel presentation of their findings. In the group at right above, new officers of the EEI committee are D. E. Nesbit (secretary), M. A. Edwards of Duke Pwr. Co. (vice-chairman) and E. J. Martin of New Orleans P. S. Inc. (vice-chairman). Facing them is the committee's EEI staff representative, Al Softy.

2. Budget review, detailing various projects
3. Purchasing advice
4. Avoiding of stock accounts
5. Regularly scheduled meetings of purchasing and user departments
6. Stock status reports to users
7. Increased efficiencies through use of automated processes
8. Open-end blanket orders
9. Development of area warehousing and vendor facilities
10. Establishment of material standards
11. Installation of new items into stock

Mr. Remalia referred to a widespread interest in electronic data processing in this area of forecasting. In the approach to "practical" forecasting, he stressed the "absolute necessity for interdepartmental coordination."

A new installation for "Utility Automatic Requisitioning" was described by C. J. Magnesen of the Commonwealth Edison Co., where the procedures have been under development for the past year. He reported details on a "simple" system which utilizes mechanical equipment to review stock balances and automatically prepare requisitions showing descriptions, order quantity receiving location, past use, and other related data. One of two methods—"machine review" or "stores location review"—accomplishes stock management of general utility materials and supplies.

Mr. Magnesen summed up the experience with this new system:

"It provides a simple automatic control of quantities to be ordered, which in turn, affords adequate control of inventories. It reduces clerical work at stocking locations by eliminating typing of requisitions and some filing. It provides a very satisfactory method for disclosure and elimination of obsolete items, and places a warning flag on some items of dubious future use by calling for a review before purchases. It permits automatic stock control for centrally located stock items, and finally, it has possibilities of being expanded to cover economically spare parts and other items of infrequent use."

Mr. Magnesen indicated that system operators are considering the possibilities of applying the mechanical review system to over 100,000 items in generating station materials and spare parts, with about 10,000 of these showing a ready adaptability to the procedure. He predicted from such adaptation "substantial savings in inventory due to a more accurate approach to requirements." (An original limit on order value handled under this new system in use at Commonwealth Edison has been raised from \$500 to \$2500.)

Answering questions concerning the manpower savings from use of the system, Commonwealth's Director of Purchases, Robert Gear, said that some jobs have been or are being eliminated from clerical staffs at various stores locations. There has been an appreciable reduction in paper-work and files.

Local Vendor Stocks

Robert F. Connolly of the Tampa Elect. Co., reporting on the "Utilization of Vendor Stocks," indicated that his utility purchasing approach is to place increasing responsibility for inventory on the distributor—"where it belongs." He reported that current utility inventory valued at nearly a million dollars is only 44-percent of the amount held five years ago. He also reported making full use of repeating requisitions and handling all types of equipment, including maintenance items on blanket orders.

Wm. S. Marks of the Commonwealth Edison Co. emphasized "inspection" in reporting for a project group on new, used and disposable material items. The most dominant opinion revealed in the groups survey of utility practice in this area is that inspection on receipt is worthwhile, and 90-percent of the companies responding to a questionnaire do inspect materials as received. Here's how such inspection is carried out: One-third of the utilities accept vendors' test reports without further test or inspection, 13 companies inspect at vendors' facilities, 21 companies have their own full-time inspectors. On wood product items 55 companies employ outside inspectors.

Walter H. Brueggmann of Wisconsin Elect. Power Co. described a newly applied punch-card system for controlling hand tools. His utility makes use of a new manual with a

new numbering system in its electrical distribution tool rooms.

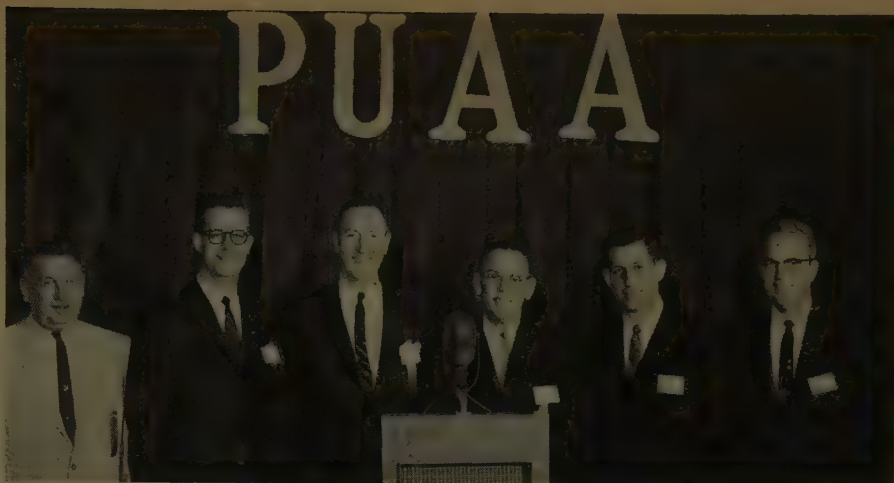
Daniel E. Nesbit of Duquesne Light Co. asserted that "a well-run library is an additional tool purchasing can use to make buying more efficient and more of a science." He observed that the efficiency of a purchasing department is often judged by its ability to locate or develop information on which purchasing decisions and policies are based—quickly and on short notice.

Mr. Nesbit reported the use of a library system which has enabled Duquesne Light Co. purchasing and other departments to get maximum use from more than 4000 publications it has on file. He said: "While there is no direct dollar and cents return that can be credited to a library, I am convinced of the value of an effective library. However, there is no one system which is ideal for all purchasing departments, and it is up to each to establish goals it hopes to achieve by setting up a library. The best rule of thumb is to keep the library as simple as possible."

Reports on Standards Progress

Reporting for a subcommittee working on materials standards, Junius F. Estill of Houston Lighting & Power Co. revealed that hurdles still stand in the way of standardization in aluminum overhead conductor and in wood poles. He said in regard to the first that "progress is being made, but large users are holding out against standardization, and as yet no standards exist." In the case of wood poles, Mr. Estill noted that one objective which must be achieved before standardization can be undertaken is agreement of a uniform basis for establishing allowable fiber stresses.

Reporting for a standard packaging and nomenclature subcommittee, Wm. Holls of the Baltimore Gas & Elect. Co. commented that the withdrawal of manufacturers from joint discussions of standard packaging problems made the work very difficult; however, he indicated that this subcommittee is now moving to deal individually with the manufacturers. Meanwhile, he emphasized the advantages of standardization achieved in the past should not be underestimated.



New officers of the PUA A are, l to r: Mead Schenck, treasurer (Interstate Pwr. Co.); Wm. L. Perdue (Kansas P. & L. Co.) and James W. Lump (Union Elect. Co.), vice-presidents; Jack A. Fleming (Canadian Western Natural Gas Co.), president; Elton E. Stuenkel (So. Jersey Gas Co.), vice-president; and Don T. Spangenberg (P. S. Co. of Colorado), secretary.

PUAA Annual Convention Speakers Stress Need for Best Talent, Shortage of Creativity

Some 250 of the utility industry's top advertising specialists who attended the Public Utilities Advertisers Association annual convention recently heard the president of one leading advertising agency advise them that the most able advertising craftsmanship and planning is needed by utilities to compete today . . . while the head of another agency declared that there isn't enough advertising creativity to go around.

Ernest A. Jones, president of MacManus, Jones & Adams, Inc., observed that utilities are doing an excellent job of making utilities "good friends." But, he urged the advertising group to question: Are we getting a full dollar's worth . . . from a dollar that is spread pretty thin and must work against "an almost monumental inertia of public attitude."

Mr. Jones expressed the view that, while users of appliances accept the benefits of these products quite readily, they don't often transfer this favorable impression to the source of those benefits—the utility. He recommended increased use of "dual-purpose" advertising, corporate in character, to keep markets in a receptive state, with "every ad used today preparing the way for tomorrow." He also cautioned against utility advertising becoming "insidiously competitive," proposing instead that utility advertising "sell the unique superiority of your prod-

ucts in an aggressive way."

The other advertising agency executive on the PUA A program, Thomas B. Adams, president of Campbell-Ewald Co., described what had been done in his agency to foster the utilization of "creativity." He offered the opinion that "nobody can be creative on a crash basis—it needs time and experience." He also expressed the hope that management can give recognition and financial reward to people without giving them the burden of administrative routine.



Thos. B. Adams



E. A. Jones

PUAA conferees heard from Detroit Edison Vice-President E. O. George, who suggested that "we need some bold thinking to improve the concepts of products we are asking you, as advertising men, to sell."

The president of Detroit radio station WJR, Worth Kramer, advised the advertisers to associate with the "good stations, who care about their entire audiences." Avoid hit-and-

run operations, he cautioned, buy value rather than price . . . and turn to those stations whose record of community service is outstanding—"they can project your image best."

Wm. M. Longman, president of Central Surveys, Inc., said that representatives of the electric business have a stake in what is "happening to the gas business, where now and for the past several years there are more local fights over ownership of gas systems than there are presently over electric systems.

Mr. Longman warned: "Once a municipal gas system gets into one of your towns, you may become much more vulnerable to agitation for the town going into the electric business as well. So I submit that here is a big area for PUAA'er's to work together rather than against each other."



Wm. Longman

Mr. Longman suggested that utility men shouldn't overlook the possibilities of a counter offensive, of reversing the recent trend toward municipal ownership. He explained: "By this I mean the possibility of eventual purchase or lease of some of the municipal systems. This has taken place in the electric industry and I am sure that some of the same reasons why communities have abandoned their electric systems will also apply, sooner or later, to the gas business, and to a great many of the municipal electric systems that still exist."

Important in reversing the trend to municipal ownership, according to Mr. Longman, has been the ability to spot warning signs early enough, providing an opportunity to straighten out the situation before it ever comes to an election. It is worth a lot more to avoid an election than it is to win one—it saves money, it saves time and effort, and it saves unpleasantness, he noted.

Mr. Longman listed these principal reasons behind the sale of numerous electric systems to the electric companies in their respective areas: (1) systems being too small to operate economically, (2) getting too tied up in political operation, (3) failure to provide for the

NAED Conference: Tell High Costs of Distribution

Trends in the electrical industry marketplace, many of which will tend to *reduce* the final total cost of end customer satisfaction, are at the same time tending to *increase* the proportion of the total cost allocated to the functions of the distributor, according to R. H. Jones, the general manager of the General Electric Supply Co., Bridgeport, Conn. He discussed the "High Costs of Distribution" for the recent annual convention of the National Association

future by setting aside adequate depreciation reserves and building ahead of future growth, (4) poor financial conditions of the cities themselves, (5) need for new capital to improve other community facilities, and (6) service problems inherent in an isolated local system.

"Sooner or later, many people become disillusioned with municipal ownership," observed the Central Surveys president.

In competition for the PUAA's annual advertising awards, 94 utility companies in the U. S., Hawaii and Canada won outstanding honors. Contest Chairman Wm. L. Perdue, director of publicity for Kansas P. & L. Co., reported that, among the total of 168 awards made in the selection of more than 2500 entries in 20 classifications of advertising and public relations material, five went to each of three companies: Commonwealth Edison, Northern States Power Co., and Pacific Gas & Elect. Co. These utilities each won four awards: Gulf States Utilities Co., Jersey Central P. & L. Co. and New Jersey P. & L. Co., Minnesota P. & L. Co., Quebec Power Co. and South Jersey Gas Co.; and 14 companies won three awards each.



Discussing program details for the PUAA conference are, l to r: Wm. L. Perdue; and Paul Penfield and Carl Welti, of Detroit Edison.

of Electrical Distributors.

Mr. Jones listed these customer actions that have tended to cause these distribution cost increases:

1. The retailer and the contractor are reducing the size of their purchase transaction to mitigate their losses from obsolescence resulting from more rapid shifts in customer buying habits and product tastes.

2. Inventory responsibility is being shifted back to the distributor because the retailer and contractor desire to reduce their risks and due to pressures of inadequate capital.

3. Customers are demanding more and more quotation and book-keeping services.

4. Customers are requiring more and more of the salesman's time . . . to see more and more people . . . to provide more and more information.

Norman D. Ferguson, chairman of the marketing committee of the National Electrical Contractors Association, asked the NAED audience for help in motivating the contractor to become a better salesman and called for more cooperative selling with contractors by manufacturers and distributors. He said:

"Your help is needed in your everyday contacts with electrical contractors to convince them they can and should sell additional electrical services to their customers. You can get on their team and they can become part of yours if you work together to sell creatively."

Speaking for the NAED Electric Heating Committee, Denton Matteson of the American Electric Co. warned NAED conferees that they might "be left high and dry and out of the electric heating business" if the Furnace Dealer is allowed to "snatch the ball from our hands." Mr. Dennison said the NAED committee conceded that it is "impossible for us to build a fence around this business and claim it for our own."

But, he said, "we can make it pretty tough for our competition to edge in on us by having a full-rounded electric heating program and actually working a plan of action." Mr. Dennison offered a 20-point list prepared by the committee for adaptation to each distributor's own tailor-made program, including the recommendation that distributors "work closely with the utilities."

Ask: Are We Making "Progress"—Answer: Yes, But, Shock-and-Burn Is Still No. 1 Problem

With the electric power industry's Injury Severity Rate continuing to climb (up again, in 1960 to 1222 days lost per million man-hours worked, compared with 1199 in '59 and 1065 in '58), the prevention of accidental electric shock and burn contacts with energized conductors is still this industry's No. 1 safety problem. Arthur J. Naquin, retiring chairman of the EEI accident prevention committee, stressed this challenge in his report to the group of 79 member company representatives in their 71st meeting held in Chicago in April.

The New Orleans P. S. Co. safety director asked: Are we making any progress? The answer, he said, is "yes and no."

"Our industry's injury frequency rate for 1960 has dropped four per cent (to 5.82 from 6.06 disabling injuries per million man-hours worked in 1959). The 1959 figure was a lower figure than the average rate for all of the 40 major industries of this country—probably for the first time," said Mr. Naquin.

The art and science of injury prevention has been materially enhanced by the hard work and devotion of so many on, and associated with, this committee . . . and the injury frequency rate of companies represented on this committee is only half that of companies not represented, Mr. Naquin observed.

In his term-ending report, Chairman Naquin emphasized evidences that "top management had assigned accident prevention to a high level of importance." He reported that "safety references" were made in 44 out of 55 company annual reports, and most of these were illustrated.

Mr. Naquin indicated that a large amount of subcommittee effort is being directed toward the National Stop Shock Program. Among the material which has been made available is the revised Specification AP-1 Specifications for Electrical Workers Insulating Safety Headgear and Anatomy of Electric Shock. This 12 minute 35mm sound slide color film is available from the Edi-

son Electric Institute for a price of \$35. It portrays the fundamental principles involved in electric shock. The booklet Exchange published three times a year and the Monthly Safety Package consisting of posters, leaflets for workers and foreman's letter are available to EEI member companies.

Trend in Resuscitation Training

In reporting for the Resuscitation subcommittee, Robert Coleman (of Baltimore Gas & Electric) obtained the committee's expression of interest in the early preparation of a film showing the application of "mouth-to-mouth" and closed-chest cardiac massage resuscitation. Such a method can keep an accident victim alive for as long as 20 or more minutes, or until a defibrillator can be employed, reported Dr. Kouwenhoven of Johns Hopkins University. Dr. Kouwenhoven noted that a number of utilities are beginning training programs and cooperating with hospitals located on their systems, and he asked that these utilities report case stories of emergency treatment to him.

J. R. Hanford (of P. S. Electric & Gas) emphasized that the prime objective of a program aimed at preventing electric shock is to get *all* levels of supervision in a utility organization actively interested. He stresses the fact that attitudes of workmen can be expected to follow the inspiration of such interest. In describing a prevention campaign of the Electric Council of New England, John Gronbeck related how much linemen want leadership in improving safety practices, saying "the work we are doing *must* get through to them."

H. Earl Hatfield of Georgia Power Co. referred to the possibility that "we have been kidding ourselves regarding theories behind past grounding practices." He reported promising results with tests of ring-type three-prong clusters in grounding structures, keeping workmen at the same potential, "perhaps affording the man the best protection we can

give him."

H. L. Rordan of the American Electric Power Service Corp. presented a special illustrated report of progress in employing the "bare-hand" method of handling energized lines, utilizing aerial basket equipment, and he noted that manufacturers are now demonstrating such equipment with traveling models.

E. H. Wessells, Jr., of Massachusetts Electric Co. delivered a preliminary report of a comparison of accident frequency for compact cars versus standard cars. The former is appreciably less, he said, and the average cost per accident is about half of the cost per accident with standard cars. Mr. Wessells also noted that driver training programs are on the increase in utility organizations.

Chairman Nanry of the atomic plant safety committee revealed that the task force of his subcommittee plans to make a survey of "Radiation Protection Data" by circulating a questionnaire in the industry. Mr. Nanry indicated that his group intends to work for the establishment of criteria for: (a) "clean" areas and equipment and (b) pre-employment and periodic medical examinations for employees in atomic power facilities.

In the direction of public education, a group of six New England companies having in production a new semi-cartoon slide film on safety in the home, tentatively titled "Electric Service in the Home."

Safety Council Reports

For the National Safety Council, Paul Sheppard reported that the Council is processing a number of data sheets, including: "Safe Switching Practices," "Operation and Care of Truck-Mounted Equipment," and "Portable Tools Aloft." NSC is also readying for use in 1962 a new series of posters on the subject of electric shock and burn, he noted.

Since its last meeting in Oct., 1960, the Accident Prevention Committee reports, there have been 10 EEI Safety Achievement Awards for two-million man hours without lost time injuries and 41 for one-injuries. In 1960 there were 110 awards to 47 company groups, compared with 134 awards in 1959, and in 1960, 66 awards were made for achievement in injury reduction.

**What happens when
you don't buy
the best machine
for the job...
simply because it's made
outside the United States?**

**Your company loses
the savings
or superior performance
the machine would deliver.**

**You discourage
the foreign trade
that last year netted
the U. S. a healthy \$5 billion
trade surplus.**

**You encourage the idea
that U. S. manufacturers
should rely on protection
instead of competition.**

**None of these are
good for you
or for the United States.**

BROWN BOVERI

Equipment for generating, transmitting and utilizing electric power.
Send for free booklet explaining the advantages of foreign trade.
Brown Boveri Corp., Dept. EP-7, 19 Rector Street, New York 6, N. Y.



Urges Depreciation Allowance Legislation . . .

Speaking before the 45th annual meeting of the National Industrial Conference Board last month, Robert S. Stevenson, president of Allis-Chalmers Manufacturing Company, told conferees that the machinery industry would become a major force in the economy's advance if Congress would come through with a piece of really positive depreciation allowance legislation. Continuing with a summary of the outlook in the machinery industry, he predicted that capital purchases would be slightly ahead of last year but that a seven to eight percent increase would be required in the second half of this year to offset the deficit recorded in the first half.

Manufacturers of electrical equipment, said Stevenson, can count on selling about five percent more in dollar volume than in 1960. Tabulations of purchasing intentions by utilities reveal that they will buy less generating equipment this year, but slightly more distribution equipment and considerably more transmission equipment, he reported, emphasizing that utilities are extremely accurate in determining their needs and in long range planning. Today's prices are very low, even below cost of production in some instances, he concluded, and we should expect that the first evidence of improvement would be firming up of prices.

I-T-E Power Circuit Breaker Launches Display-On-Wheels Showroom

Rolling cross-country for I-T-E Power Circuit Breaker Division is a 35-foot, air-conditioned "travelling showroom" featuring operational power circuit breakers and associated equipment for on-the-spot display at utilities and industrial companies using this equipment.

Dates of display in any particular city may be obtained at any of the local I-T-E district offices.



Air-conditioned 35 foot mobile showroom which will make year round tour presenting I-T-E products to utilities and industrial companies.



It is simple and easy to drill holes with one hand, even at right angles to the lineman's position. Note this is an electric impact wrench.

New Drilling Tool Eases Lineman's Job

Drilling holes in wood poles, timbers, and cross-arms—one of the lineman's most difficult jobs—has been made simpler and easier through the use of a ship auger wood bit and an impact wrench.

Louisiana Power & Light Company in cooperation with Snap-on Tools Corporation of Kenosha has developed this technique by adding a 1/2-in. square-drive socket head to a ship auger wood bit and driving this bit with an ordinary 1/2-in. square-drive wrench, both electric and pneumatic.

Director Sees New Copper Developments Sparking Bright Sales Future

"We feel that the effects of technology on future copper markets will be most positive and that present surplus capacities will not for long obtain." These optimistic views were expressed by Dr. Charles H. Moore, Technical Director of the Copper Products Development Association, in a paper presented at the 15th New England Regional Conference of the Metallurgical Society of the American Institute of Mining, Metallurgical, and Petroleum Engineers.

Dr. Moore stated that there is no claim of intent to win back markets that other materials have taken and can serve just as well, or better. "Instead," said Dr. Moore, "the CPDA seeks to develop copper as the one best material for specific uses, regardless of price or competition."

MORE PAGES FOR EBASCO'S



GRAHAM STEAM ELECTRIC STATION
(Unit No. 1)—220,000 KW
for Texas Electric Service Company



OCOTILLO STEAM ELECTRIC STATION
(Unit Nos. 1 and 2)—220,000 KW
for Arizona Public Service Company



PORT JEFFERSON POWER STATION
(Unit No. 3)—185,000 KW
for Long Island Lighting Company



MONTROSE STEAM ELECTRIC STATION
(Unit No. 2)—175,000 KW
for Kansas City Power & Light Company



SAM BERTRON STEAM ELECTRIC STATION
(Unit No. 4)—220,000 KW
for Houston Lighting & Power Company



DAVE JOHNSTON STEAM ELECTRIC PLANT
(Unit No. 3)—100,000 KW
for Pacific Power & Light Company

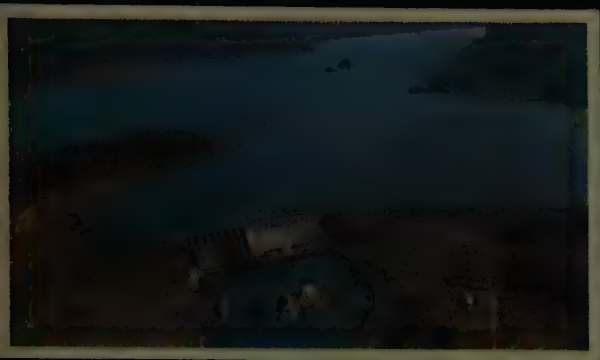


YOKOSUKA THERMAL POWER STATION, in Japan (Unit No. 1)
—265,000 KW—International General Electric Company
for Tokyo Electric Power Company, Inc.



NORTH LAKE STEAM ELECTRIC STATION
(Unit No. 1)—175,000 KW
for Dallas Power & Light Company

ALBUM OF ACHIEVEMENT



NOXON RAPIDS HYDROELECTRIC DEVELOPMENT
(Unit No. 4)—100,000 KW
for The Washington Water Power Company



T. H. WHARTON STEAM ELECTRIC STATION
(Unit No. 2)—220,000 KW
for Houston Lighting & Power Company

in 1960 12 more major projects completed

Shown here are the 12 major Engineering and Construction Projects EBASCO completed during 1960 at a total cost of \$290 million. Located in seven states as well as in Japan and Brazil, they range in cost from \$9 million to \$54 million.

Our brochures describe EBASCO'S services and how they may be of use to you. For copies, write to Ebasco Services Incorporated, Dept. 7, Two Rector Street, New York 6, N. Y.

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PEIXOTO-FURNAS-BELO HORIZONTE
345-400 Kv Transmission Line in Brazil
for Central Elétrica de Furnas S. A.

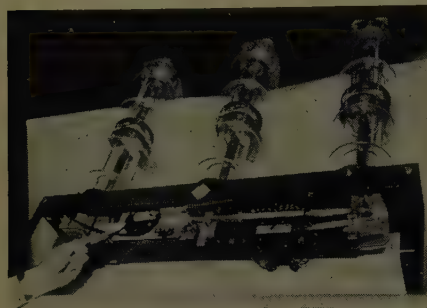


H. B. ROBINSON STEAM ELECTRIC PLANT
(Unit No. 1)—152,000 KW
for Carolina Power & Light Company

Consulting • Engineering • Design • and Construction • Purchasing • Expediting • Inspection and Traffic • Taxes • Financial Management and Accounting • Valuation and Appraisal • Marketing and Sales Management • Manufacturing and Plant Management • Research and Development • General Management • Personnel Management and Labor Relations • Office Management • Insurance, Safety, Pensions • Public Relations • Facilities Planning • Rates and Pricing • Community Planning and Urban Renewal • Industrial Development • Washington Office

Motorized Operator

A motorized operator by Allis-Chalmers Mfg. Co. is available for



its Type VSC, 3-phase, 15-kv, 300-amp, vacuum capacitor. It may be powered from 115-v ac or dc, or 230-v ac or dc. Motor draws between 0.2 and 0.8 amp. Switch is designed to simultaneously interrupt all phases under all weather conditions. Vacuum interrupter is sealed, requiring no maintenance, and manufacturer claims that contacts will last many thousands of operations. Switch is available with four auxiliary contacts as standard.

Circle item #1 on reply card

Cantilever Floodlight

"Mitchell" Cantilever floodlights are fabricated of structural and cast



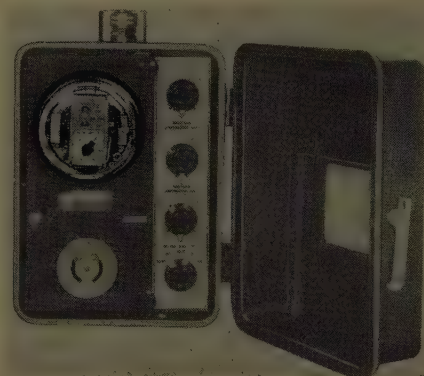
aluminum. Ends of luminaire are of cast aluminum for maximum strength and center support sections fabricated of structural aluminum, precision die formed. Outer body shell is formed of structural aluminum. Aluminum reflectors are precision formed for maximum lighting efficiency. Clear Plexiglass shields are completely gasketed to keep

lamps and reflectors clean. Recommended for shopping centers, parking lots, airports, used car lots, plant security lighting, approach areas and service stations.

Circle item #2 on reply card

Electronic Sensing Device

Electronic sensing devices by Line Material Industries for use on RSD, distribution-type regulator controls provide simple, rapid, and accurate setting of band-width limits. Turn-



ing one knob, simultaneously sets both upper and lower band width limits. No external instruments are required. Readily-visible scale provides accurate calibration in 1-v increments from +1 and -1 to +6 and -6v. Accuracy of the device is claimed not to change with usage. Electronic components are completely encapsulated and mounted on meter-base socket.

Circle item #3 on reply card

Screw Anchors

"Powerdrive" screw anchors by Hubbard and Company are installed with a power digger and are said to provide more positive holding power due to minimized earth disturbance during installation and increased helix diameters. By eliminating usual installation variables—digging, expanding, backfilling and tamping, manufacturer claims that they are more consistently dependable and that stronger anchoring is attainable. A wrench, also available from Hubbard, transmits the torque from the power digger directly to the hub of the anchor wing.

Circle item #4 on reply card

Fused Interrupter Switch

Fused interrupter switch by Pennsylvania Transformer Div. of



McGraw-Edison Co., called the "Loadmaster 100," is a 600-v individually-enclosed unit with full drawout construction. High-interrupting capacity and safety features are applicable to service entrances and other electrical system applications having high fault capacities. Unit is available in 800- and 1600-amp models. A spring-charged operating mechanism assures fast opening and closing of contacts. All models are electrically operated from a remote point and protection against single-phasing is provided.

Circle item #5 on reply card

Side-Entrance Deadend

"Wejit" side-entrance deadends by Burndy Corp. are available for



cable sizes # 6-# 2 AAC and # 6-# 2 ACSR. Manufacturer says it can be attached at the house or pole in two simple steps, without threading cable or disassembling connector. Both jaws grip cable for their full length. Holding power has been tested up to 1,300 lb. Major parts are of aluminum and stainless steel. They are said to be unaffected by

(Continued on page 67)

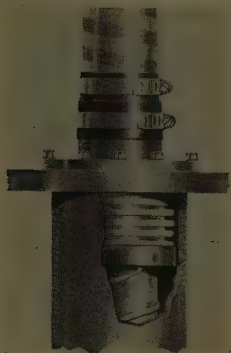
(Continued from page 64)

vibration and do not expand and lose their grip under severe freezing.

Circle item #6 on reply card

End Closure

End-closure for pipe-type cables by Anaconda Wire and Cable Co. is an end seal that allows for expansion and contraction of the cable. It



is said that no excessive pressure is required against the cable which might damage insulation and the oil seal is not disrupted by cable movements. Application is for semi-stop joints and potheads on high pressure, oil-filled, pipe-type systems.

Circle item #7 on reply card

Magnetic Crack-Detector

A portable magnetic device for detecting cracks and flaws in fer-

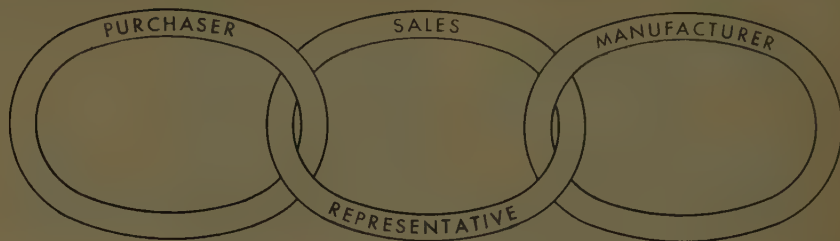


rous metals being marketed by Westinghouse Electric Corp., is essentially a powerful U-shaped two-pole electromagnet energized from a 6- or 12-v automobile storage battery or from a 110-v service outlet through a built-in rectifier. It is claimed that little if any operator training is necessary to permit detection of invisible hairline cracks or flaws as deep as $\frac{1}{2}$ in. below the surface.

Circle item #8 on reply card

Electric Light and Power, July 1, 1961

THE CONNECTING LINK



The **SALES REPRESENTATIVE** serves as a connecting link between the **PURCHASER** and the **MANUFACTURER**. The qualified rep is well informed concerning the customer's requirements and thoroughly familiar with the manufacturer's products. The rep's function of properly fitting together needs and products benefits all concerned.

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The **MANUFACTURER** gains a capable and efficient marketing organization at a predetermined low sales cost. The numerous contacts of each rep's sales personnel are especially valuable.

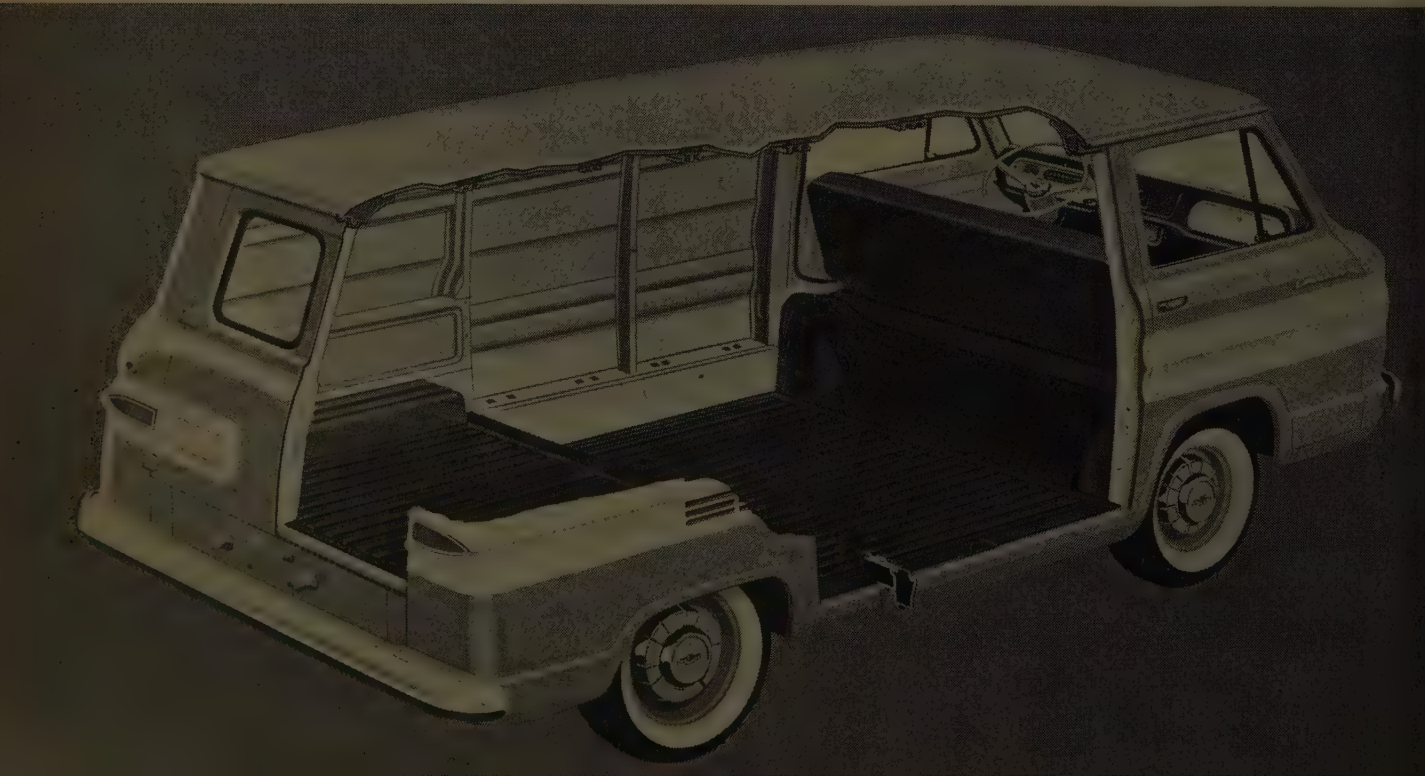
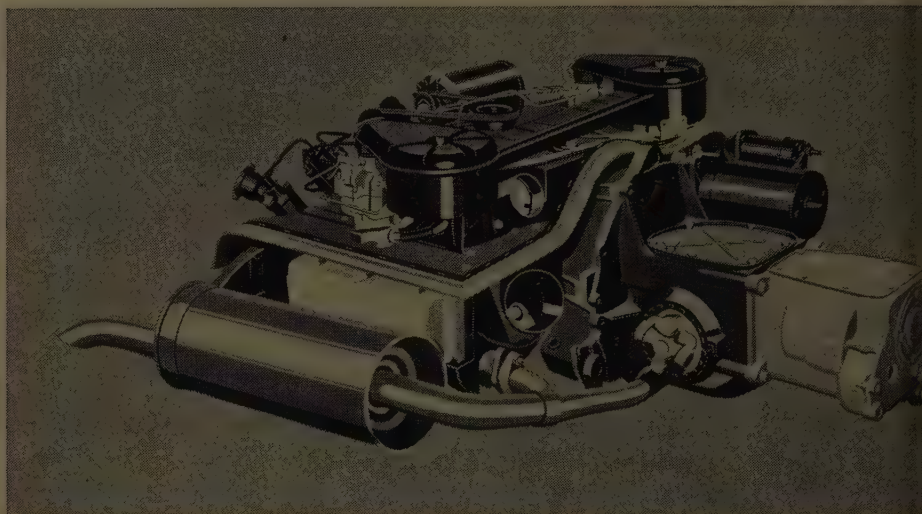
ELECTRICAL EQUIPMENT REPRESENTATIVES ASSOCIATION, founded in 1948, is dedicated to **BETTER SELLING** and **SERVICE**. Its members are ambitious to improve their performances and to benefit by the interchange of experiences and ideas with others in the same line of work.

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ELECTRICAL EQUIPMENT REPRESENTATIVES ASSOCIATION



THERE'S A DOLLAR-SAVING DIFFERENCE IN CORVAIR 95!

We mean there's a whopping difference—the kind that puts a truck in a class by itself. You can see it, too, especially if you know where to look. In Corvair 95 design details, for instance—the things that tell you a truck is built with care throughout, crafted in a quality way that means more miles before trade-in and less expense along the route. We mean it's the kind of difference that will pay off in dollars every day on your job!

◀ **Power team and driver compartment—evidence of extra efficiency.** Tucked neatly between the rear wheels is the most practical truck-design idea in years—the Corvair 95 *Unipack* power team. Engine, transmission and rear axle are combined in one compact, *durable* unit. Power is delivered to the rear wheels by the shortest, most efficient route. This unitized power train design (including an engine that measures only 17" high) takes up less space—allows for more cargo area in the truck's interior. The engine itself is something new in save-as-you-go power: a tough aluminum air-cooled 6 that moves your loads briskly on a minimum of gas. Up front, the big difference in Corvair 95 design is apparent in a driver compartment that gives you bird's-eye visibility (no hood to limit vision), plenty of leg room, and a comfortable foam cushioned seat—full-width seat is optional at extra cost.

◀ **Corvan's stay-together build goes unchallenged in this field.**

Unitized body construction means maximum strength with minimum weight—for bigger cargoes.

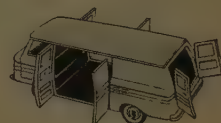
Super-rigid frame-floor assembly outperforms combination of separate frame and body floor. Eliminates a major part of a separate frame's weight.

All-steel double-walled side panels and doors strengthen the body structure. Extra toughness is engineered into a body that gives more room inside.

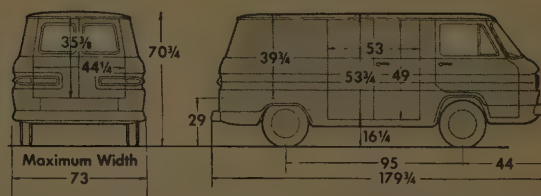
Friction-free coil springs at all four wheels assure top load-carrying capacity and *smooth* ride.

Side-loading platform is only 16¼" off the ground—loading's never been easier, yet there's plenty of clearance below for maneuvering over rough spots.

Big cargoes are easy to load through wide side doors. Doors open so wide that you can load a 4' x 4' crate with ease! Right-side doors standard, left-side doors optional, extra cost.



Engine access door speeds up servicing—gives fast access to oil filler, distributor, coil, generator and oil filter.



Dimensions point up new utility. Note short wheelbase, low side and rear loading heights.

There are literally scores of reasons why no other truck of this type can do so much to put you dollars ahead. There's a cargo area that's 10 feet long . . . with balanced weight distribution that enables a Corvan to carry up to 1,700 lbs. of payload with a 4,600-lb. GVW. There's a short 95-inch wheelbase for nimble maneuvering; deep-biting traction with engine weight in the rear; handsome styling that's good for business.

That's Corvair 95's special brand of *efficiency*, ready to give you bigger profit hauling in the years ahead. See for yourself at your Chevrolet dealer's. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

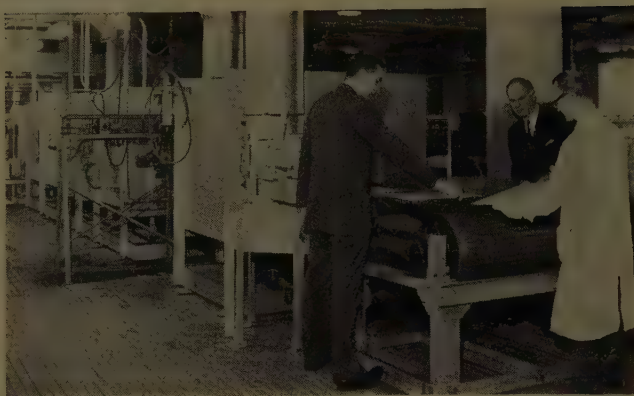
1961 CHEVROLET STURDI-BILT TRUCKS



| SUPPLY FACILITIES

Westinghouse Expands Electroluminescent Facilities

Westinghouse officials inspect a portion of the company's new electroluminescent manufacturing facilities which now produce the new light panels in metal, glass, and plastic.



Production facilities for manufacturing electroluminescent panels have been substantially increased at the Westinghouse Bloomfield Lamp Division, according to a recent announcement. The new facilities will enable the company to produce the new light panels in metal, glass, and plastic, to meet almost endless lighting and decorative needs. For example, the metal panels have many applications such as safety night

lights, instrument dials, meter faces, clock dials, etc. Plastic panels are particularly desirable for applications where breakage is apt to be an important factor . . . plotting devices, instrument panels, etc. Glass panels are useful for readout devices and for infinite decorative applications.

Westinghouse is said to be the only source for the electroluminescent panels in all three materials.

Companies To Integrate Control System Efforts . . .

An agreement of mutual support in the engineering and marketing of automated control systems and processes has been announced by Allis-Chalmers, Consolidated Systems Corp., and International Business Machines Corp. When it is in the best interests of the customer to have a coordinated system, the three companies will work together in an effort to integrate the various equipments of each manufacturer into a single unitized system. A typical integrated system, for example, would utilize A-C's basic industrial equipment, Consolidated's special instrumentation, and IBM's data processing equipment.

The agreement affords each participant the opportunity to work with others whenever appropriate.

Femco Enters Microwave and Carrier Field . . .

Femco, Inc., Irwin, Pa. manufacturer of telemetering, monitoring, and remote control systems for the gas and water industries, has expanded into the electric utility field via purchase of the manufacturing rights on microwave and carrier equipment formerly produced by the Power Control and Communications Department of Westinghouse, according to a recent announcement. Purchase is said to include all inventories, drawings, specifications, patents, and equipment needed to complete Femco's facilities.

In addition to manufacturing present products, Femco will embark upon an extensive product development program, according to W. P. Place, company president. Projects already started by Westinghouse

will be completed, and Femco will assume responsibility for servicing existing installations, maintaining them, and expanding them. Projects involving Femco systems will be extended to include the newly-acquired lines.

A. B. Chance To Produce Alcan Conductor Accessories . . .

A licensing agreement for the manufacture and distribution in the United States by A. B. Chance Co. of electrical conductor accessories designed by Aluminum Limited was announced jointly last month by the two firms. Under the agreement, Aluminum will supply the Alcan designs and manufacturing techniques to Chance; Chance, in turn, will produce and market the accessories through its national sales organization.

New Laboratory Evaluates Ceiling Lighting . . .

An unusual laboratory to test and evaluate luminous ceiling material began operations last month at the Berkeley, Calif. headquarters of Hexcel Products Inc. The laboratory is so constructed that on-the-job room conditions of commercial, industrial, and residential areas . . . including ceiling height, beams and ductwork . . . can be exactly simulated and tested prior to installation. Hexcel engineers will also use the new facilities to evaluate new lighting or luminescent materials, light outputs at working levels, and use of colors in lighting.

The facilities of the new laboratory and the services of company engineers are available to architects, consulting engineers, and companies desiring design or technical assistance on lighting.

Sales Briefs

Formation of a Special Products Dept. to coordinate and direct market opportunities in measurement and control sub-systems has been announced by Industrial Products Group of Daystrom, Inc. The new department will have complete re-

sponsibility for project control in the sub-systems field—including design, engineering, and marketing. Among the many sub-system products of the new department are data loggers and scanners, supervisory control panels and stations, alarm devices, special test equipment and automatic process control instruments.

Electronics Supply, Inc., Great Bend, Kansas, has been named distributor for **Allis-Chalmers** controls and transformers in Kansas. Area served by the firm is all counties north of and including Greeley, Wichita, Scott, Lane, Ness, Rush and Barton, and all counties west of and including Russell, Osborne and Smith.

The Brady Supply Corp., Elmira, N. Y., has been appointed a distributor for **Allis-Chalmers** regulators, power transformers, switchgear, circuit breakers, and capacitors. Area served includes Chemung, Steuben, Schuyler, Tompkins, Allegany, Tioga, and Yates counties in New York and Tioga and Bradford counties in Pennsylvania.

Haizlip Jobber Suppliers, Inc. has been appointed sales representatives for **Harvey Aluminum** rigid conduit in Kansas, Nebraska, Western Iowa and Western Missouri. **Harvey Aluminum** manufactures a complete range of aluminum rigid conduit, elbows, and couplings.

Relocation of four branch offices and the opening of two new offices has been announced by **National Electric Division, H. K. Porter Co., Inc.** The division's Detroit, Mich., office is now at 50 W. McNichols Road; the Houston, Texas, office is now at 3810 Westheimer Road; the Los Angeles, Calif., office has been moved to 6900 E. Elm St.; and the Chicago office has been relocated to 2567 Greenleaf Ave., Elk Grove, Ill. Two new offices have been established at 1909 Vestavia Court, Birmingham, Ala., and at 612 Kahl Building, Davenport, Ia.

POLES

AMCRECO: Poles, crossarms, lumber. Pressure treated—All standard specifications. Stocks maintained. American Creosoting Corporation, 121 S. 5th St., Louisville 2, Ky.

MEN OF POWER



Pope

George Pope, former manager of manufacturing, was elected vice president - manufacturing of Hubbard and Company's Cicero plant. Before joining Hubbard in October, 1959 he was manager of Metal and Thermit Corp. plants in Chicago and New Jersey. Because of his experience in various phases of management, he is in demand as a teacher and lecturer.

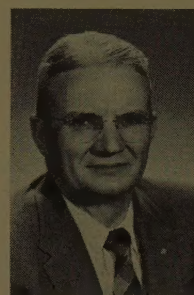
* * *

L. M. Shadgett, vice president and Athens division manager since 1937, has been named vice president and assistant general manager of the Georgia Power Company. He has served as chairman of the Georgia section of the American Institute of Electrical Engineers, and of the Edison Electric Institute's accident prevention commit-

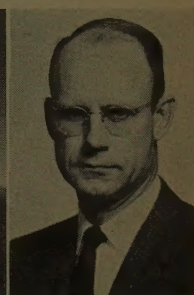
tee. **Ben W. Burton**, Athens division superintendent since 1952, succeeds Mr. Shadgett as vice president and Athens division manager.

* * *

Central Illinois Light Company has announced the appointment of **Oscar L. Sundstrom**, left, former general superintendent of electrical production and transmission, as assistant operating vice president. He is a past officer of the Northwest



Sundstrom

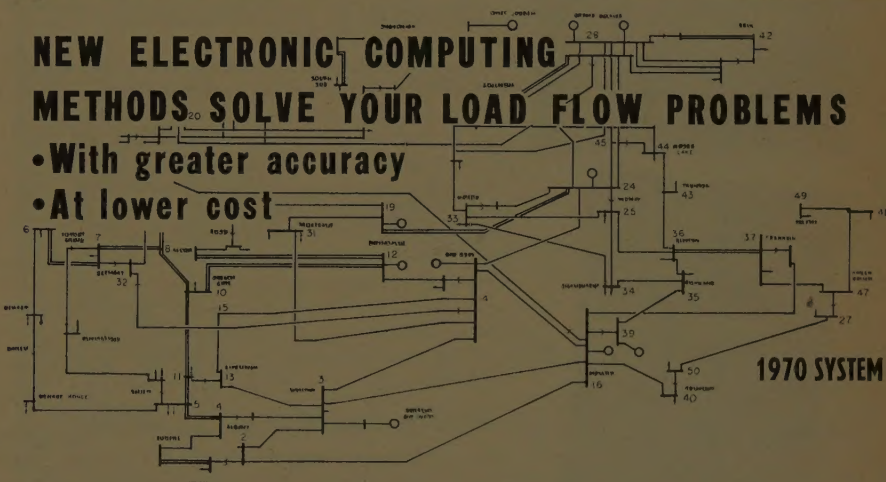


Burton

Region of the Interconnected Systems Group, and has served CILCO in various positions since 1924. Suc-

NEW ELECTRONIC COMPUTING METHODS SOLVE YOUR LOAD FLOW PROBLEMS

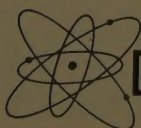
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A highly advanced computer program available to you through **DATA, Incorporated**, produces greater accuracy at lowest unit cost. Solutions provided for power system load flow problems having up to 300 busses, 600 branches and 100 variable bus types.

The cost for solution for a standard 25 bus system is \$25 (minimum charge). For large system, multiple case solutions, rates quoted on request.

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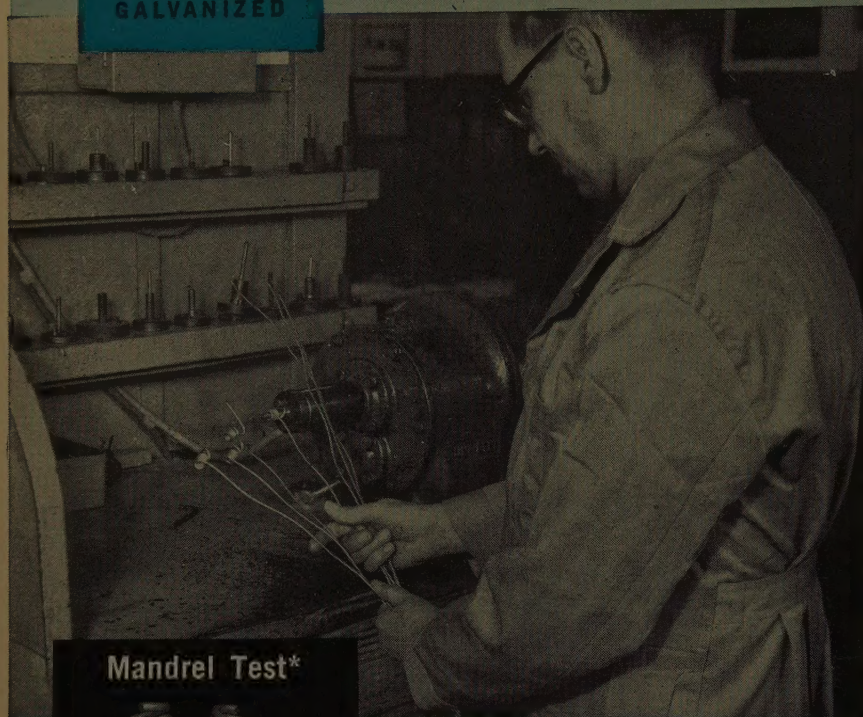
Company

Street

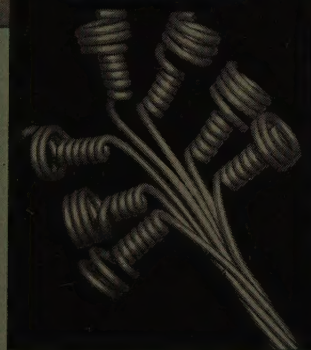
City State

Crapo
GALVANIZED

STEEL STRAND



Mandrel Test*



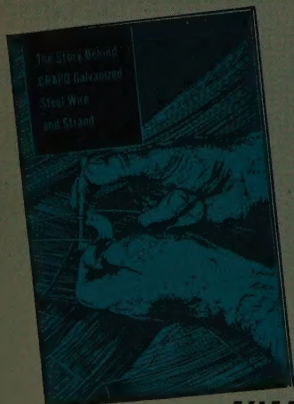
Checked and Double-Checked by Laboratory Technicians

Every coil of wire used in the manufacture of *Crapo* Galvanized Steel Strand is tested and approved by trained laboratory technicians. Samples from both ends of each individual coil are subjected to a series of prescribed tests before stranding. Then, the finished strand is re-checked to make certain that it conforms in every respect to established specifications and our own high quality standards.

Thus you know when you specify *Crapo* Galvanized Strand that every precaution has been taken to assure maximum performance in the finished product.

Write for Free Booklet

"The Story Behind *Crapo* Galvanized Wire and Strand" illustrating and describing manufacturing techniques and testing procedures. Ask for Booklet B-59!



AVAILABLE IN 3 COATING WEIGHTS

FOR GUYS, MESSENGER AND OVERHEAD-GROUND WIRE

Crapo Steel Strand is available in all standard sizes and grades and in Class A, B and C galvanized coatings. Class B coating is twice as heavy as Class A coating; Class C coating is three times as heavy.



*Determines ductility of wire and adherent quality of galvanizing.

INDIANA

STEEL & WIRE CO., INC.
Muncie, Indiana

ceeding Mr. Sundstrom is A. Herbert Davis, right, former chief engineer of the company's new E. D. Edwards Station. William T. Reid, Jr., who has been with the company since 1949, will become chief engineer at the Edwards Station.

* * *

After moving up through the ranks to become president and general manager in 1954, J. L. "Bill" Bates has been elected president and chairman of the board of Central Power and Light. E. S. Joslin, who started with the company in 1927, has been elected vice president and general manager.

* * *

Herbert H. Rogge has been elected a director and named chairman of the Executive Committee of Burndy Corporation. Most recently, he was executive vice president and then president of the American Car and Foundry Division, ACF Industries. Prior to that, he was president and chief executive officer of Canadian Westinghouse.

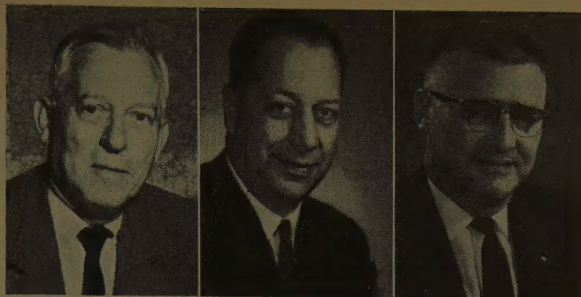
* * *

J. A. Elzi, M. C. Westrate, and C. E. Asbury have been elected vice presidents of Commonwealth Associates, Inc. Mr. Elzi will continue to serve as director of engineering administration, and Mr. Westrate as treasurer and chief consulting engineer. Mr. Asbury continues his duties as chief electrical design engineer. C. H. Alban and E. Weatherly, Jr. have been named directors, and J. A. Meader was elected assistant secretary. Mr. Alban, who was recently elected a director of Commonwealth Services, Inc., is also assistant treasurer and chief structural design engineer of Commonwealth Associates, while Mr. Weatherly is a project manager.

* * *

Former Vice President-Operations, J. Lawrence McNealey has been appointed executive vice president of Columbus & Southern Ohio Electric Company. He has been with C&SOE since 1923, and became vice president in 1954. Frank H. Streit vacates the production department manager's chair to become vice president-electrical operations, a current project of which is the construction of the third 125,-

New vice presidents of Columbus & Southern Ohio Electric Company are: from left, J. Lawrence McNealey, Frank H. Streit, and Arthur Green.



000 kw unit at Conesville. Elected Vice President-Controller, **Arthur Green** has been with the company since 1934, and has been controller since 1950.

* * *

Westinghouse Electric Corporation, Micarta Division, has announced the appointment of **David Hodowanetz** as sales manager of the insulating materials section. Mr. Hodowanetz, formerly technical service engineer specializing in industrial finishes, will continue a program giving more intensive advice and assistance to industries using insulating materials. Now manager of the liquid insulating materials plant in Minor, Pa. is former Sales Manager, **J. G. Wynn**.

* * *

J. L. Price, system dispatcher, Southern California Edison Company, was elected president of the American Power Dispatchers Association at their National Spring Meeting. Also elected were **J. T. Morcom**, Salt River Power District, vice president; **R. H. Renfro**, Southern California Edison Company, secretary; **C. M. Merrell**, City of Glendale, California, treasurer.

* * *

Joining Illinois Power Company is **L. N. Talbott**, former employee relations director for Central Illinois Light Company the past six years. He will be engaged in industrial relations activities, and will headquarter in Decatur, Illinois.

* * *

At the controls of a newly formed Special Products Department of Allis-Chalmers Manufacturing Company is **Kenneth R. Geist**, former director of purchases, serving as general manager. He will develop new businesses for the company using products, materials and processes which will come principally from the firm's research and development centers. **Fred J. Mac-**

Dougall succeeds **Mr. Geist** as director of purchases.

* * *

New General Manager Power Division of the Fluor Corporation, Ltd. is **John H. Hemsarh**.

* * *

Westinghouse Electric at Blairsville, Pa. has announced the appointment of **S. Chetlin**, former sales manager of the materials manufacturing department, as engineering manager. Also appointed were **E. C. Bishop**, former engineering manager, as technical coordinator; **E. V. Clarke** as marketing manager, and **R. C. Humphrey** as manager of management and staff services.

A. G. Steinmayer, vice president Line Material Industries and co-inventor of the first successful drop-out fuse cutout, has retired after 38 years in the industry.

* * *

Former Staff Production Coordinator, **W. A. Stevenson** has been named supervisor of power supply and scheduling for Arizona Public Service Company.

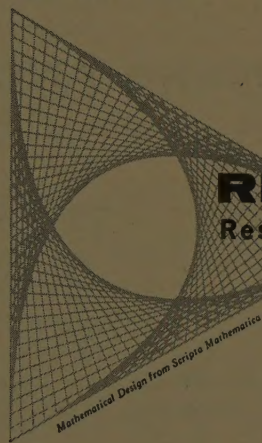
* * *

Responsible for sales and application of solid state systems, **P. Morris Burgess** has been appointed by the Special Systems division of Minneapolis-Honeywell Regulator Company as a specialist in load and frequency control systems. He joined Honeywell in 1959 as a system engineer.

* * *

Now manager of the Utility Products Division of the Thomas & Betts Company is **Richard J. Heh** who has served as assistant manager since 1957. He will be in charge of design specifications for new products, sales promotion, and field engineering.

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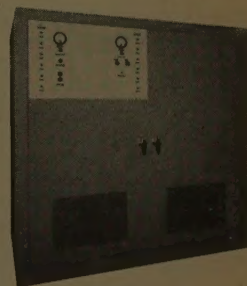
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CALENDAR OF EVENTS

June 25-28 — 54th Annual Meeting, American Society of Agricultural Engineers, Iowa State University, Ames, Iowa.

June 26-28—American Society of Heating, Refrigerating and Air Conditioning Engineers Annual Meeting, Denver, Colo.

June 28-30—American Institute of Electrical Engineers, Instrument Society of America, American Institute of Chemical Engineers, American Society of Mechanical Engineers, Institute of Radio Engineers, Second Joint Automatic Control Conference, University of Colorado, Boulder, Colo.

June 28-30—NRECA Board of Directors Meeting, NRECA Building, Washington, D. C.

July 18-20 — Western Plant Maintenance & Engineering Show, Pan Pacific Auditorium, Los Angeles, Calif.

July 25-Aug. 10—1961 Chicago International Trade Fair, McCormick Place, Chicago, Ill.

Aug. 7-11—Western Resources Conference, Colorado State University, Ft. Collins, Colo.

Aug. 23-25 — AIEE Pacific General Meeting, Hotel Utah, Salt Lake City, Utah.

Sept. 6-8—AIEE-IRE-ISA Joint Nuclear Instrumentation Conference, North Carolina State College, Raleigh, N. C.

Letter To The Editor

Dear Mr. Garrett:

Congratulations on your editorial page in the May 1 number. I was delighted to read your objective remarks on two very important subjects, namely, Higher Secondary Voltage and Standardization of Pad-Mount Transformers.

Such editorials in your widely read and highly respected magazine perform very helpful services to those of us who are working on these projects. Your timely words provide a very helpful boost.

Very truly yours,
David Burns, Chief of
Transmission & Distribution,
General Engineering Department,
The Detroit Edison Company



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